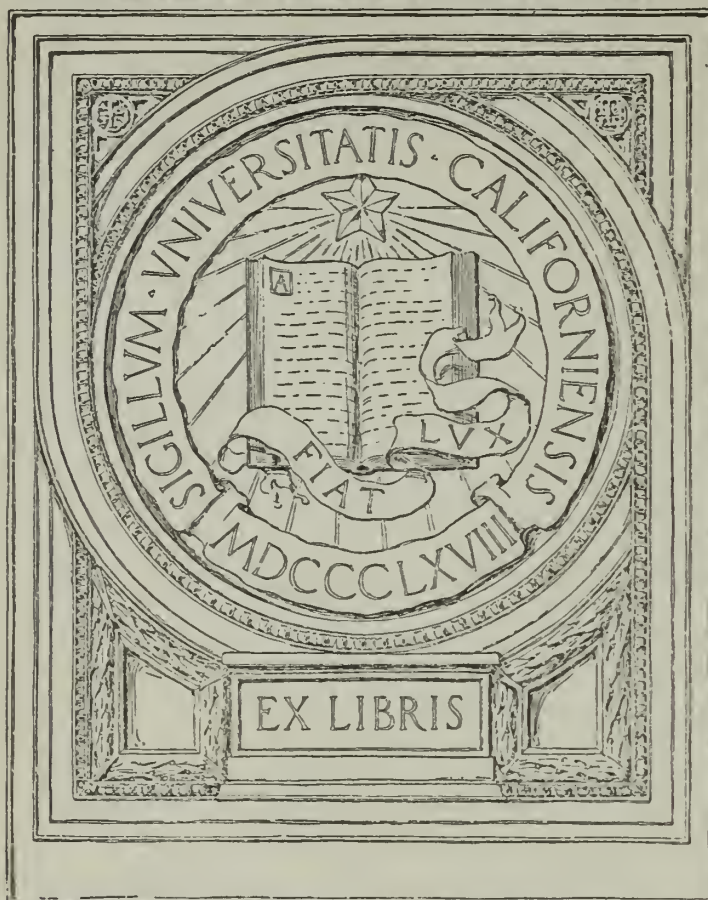




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*Pre-Palaeolithic Man*  
*The Great Flint Imple-*  
*ments of Cromer, &c.*

THE  
ANTIQUITY OF MAN  
IN EAST ANGLIA

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PLATE I



GREAT HAND-AXE WEIGHING 7 lb.  
from the Cromer Forest Bed



*The*  
ANTIQUITY OF MAN  
IN EAST ANGLIA

by

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## PREFACE

MANY archaeological paths lead to East Anglia, and I have been urged by many of my colleagues to publish, in book form, the results of the researches into the past history of man which have been carried out in this area. There is, perhaps, no other part of the world richer in the remains of our remote ancestors than that of Suffolk and Norfolk, and in this volume I have endeavoured to give an easily-understood account of these remains, which, in many cases, are of such a nature as to have implications extending far beyond the relatively small area in which they have been discovered. I would wish to express my thanks to the numerous friends who have helped me in my investigations, and especially to the Trustees of the Percy Sladen Memorial Fund, and other private donors for the generous financial aid afforded me in paying for the labour employed in the diggings. I am also indebted to the following societies and publishers for their kind loans of blocks: The Royal Anthropological Institute, The Prehistoric Society of East Anglia, The Society of Antiquaries of London, The Suffolk Institute of Archaeology and Natural History, The Ipswich and District Natural History Society, Messrs Williams and Norgate, Ltd., and to the Editor of *Science Progress* for permission to reproduce Chap. vii in practically its original form.

Examples of the East Anglian flint implements and other relics described can be seen and examined at the Natural History Museum, High Street, Ipswich.

J. REID MOIR

*September 1926*



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ABBREVIATED REFERENCES  
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<i>R.A.I.</i>	Royal Anthropological Institute
<i>A.ŷ.</i>	Antiquaries Journal
<i>P.S.E.A.</i>	Prehistoric Society of East Anglia
<i>S.I.A.</i>	Suffolk Institute of Archaeology
<i>Man</i>	<i>Man</i> , published by R.A.I.
<i>I.N.H.S.</i>	Ipswich Natural History Society



## CHAPTER I

### *The Pleasures of Flint Hunting*

THE collecting of the flint implements, and other relics, of prehistoric man is, essentially, an open air branch of science, for the sites where men now congregate are often far removed from those occupied by the people of the Stone Age, and thus it is that those who follow the trail of the ancient hunters of the remote past, find themselves, frequently, in the wild and unvisited places of Nature. To the gregarious person—who experiences little pleasure except in the company of numbers of his fellow-men, and surrounded by manifold evidences of modern civilisation—the solitude of the great open spaces makes little, or no, appeal, but, for others, to sojourn for a time in such places brings a deep and a lasting happiness. Though East Anglia is a part of the country where the scenery is not of the “grand” order, yet it possesses a charm and a beauty unique, and all its own. The widespread sandy heaths with their characteristic flora and fauna, contrasting so markedly with the wheat-growing Boulder Clay lands, the broad valleys with their rivers flowing sluggishly to the sea, the great sea-cliffs of north-east Norfolk, the ancient villages and remarkable churches, all combine to form a picture of a geological, and human, past that cannot fail to impress, and to interest, those who have the eyes to see and to understand it. For the student of ancient man there is, perhaps, no more prolific hunting ground in existence than that of East Anglia. From the very beginning of the Age of Man this area has been occupied by successive races of prehistoric people, and their weapons and implements are found entombed in a series of deposits which by great good fortune has been preserved, a fact that has enabled us to write many new chapters of the history of our earliest ancestors. The relics of the later prehistoric races are generally found upon the surface of the ground, and are most abundant on heath and “light” lands where the soil is dry, than upon areas where the reverse is the case. The reason for this is doubtless that ancient man preferred, as we do, to live upon well-drained soil, rather than upon that which was damp and apt, in wet weather, to become waterlogged. Thus, the sandy districts of east and north-west Suffolk, and similar

## THE PLEASURES OF FLINT HUNTING

country in Norfolk, have yielded the greater number, and most of the best specimens of the work of later Stone Age Man found in East Anglia. To spend some time in late spring or early summer in an examination of the lonely and beautiful heath lands of north-west Suffolk, and south-west Norfolk, in search of flint implements is, from the archaeological standpoint, a very profitable and enjoyable undertaking, for not only are valuable specimens frequently found on such excursions, but the undulating country with its pageant of wild flowers and animal life is of extraordinary beauty and interest. But it is not only upon the surface of the ground that flint implements are discovered, and if the older examples of man's handiwork are to be found, it is necessary to visit brickfields and other places where sections of various ancient deposits are to be seen. The archaeologist owes a great debt to those who dig in the ground for commercial purposes, because these excavations are usually of considerable extent and afford opportunities for examining ancient strata, such as could not be easily provided by any archaeological digging. The larger the excavation, the better is the prehistorian pleased, and he no doubt sometimes dreams of limitless sections where flint implements abound, and all his geological problems could be solved. The nearest approach to this ideal of perfection is, perhaps, to be found upon the north-east coast of Norfolk, where, from Happisburgh to Weybourne, there stretches a line of cliffs, some 20 miles in length, composed of deposits very rich in some of the earliest vestiges of man (Plate II). The Cromer coast is, in fact, an Eldorado for the geologist and the archaeologist, and moreover is one of those places, not now easily found, where it is possible to walk for hours amidst beautiful surroundings and to avoid seeing any signs of civilisation so apparent at most seaside resorts. To tramp from Mundesley to Cromer on a spring day when the sky is blue and the sun brilliant is an experience not soon forgotten. The distance is about 9 miles, and for the whole way the great cliffs, sometimes 200 feet in height, on the one hand, and the shelving beach and far spreading foreshore of golden sand on the other, outlined in startling clearness in the dry and invigorating East Coast air, present a picture of entrancing beauty. But, though even when the weather and the sea are calm, it is possible to find a good





VIEW OF THE GREAT CLIFFS, 200 FEET HIGH, SOUTH-EAST OF CROMER

The Cromer Forest Bed rests at about the level of the beach, while the material above it is composed of glacial deposits



## THE PLEASURES OF FLINT HUNTING

number of flaked flints of the ancient Cromerians, and the bones and teeth of the now extinct animals with which they lived, yet, to recover the biggest number of these interesting relics it is necessary to visit the Norfolk coast in the winter, when a succession of on-shore gales and high tides have scoured away the beach and exposed the beds that underlie it. At such times the temperature at Cromer can be very low, and it is needful to possess a hardy constitution and a deep-seated archaeological keenness to face the weather conditions upon the coast. Inland, the country between Cromer and Weybourne is unique and beautiful. The geological conditions that gave rise to the formation of this area were glacial, and have resulted in a series of high and isolated hills and valleys covered with pine trees and bracken such as are seldom met with in any other part of England. It might be thought that a knowledge of geology would not be an aid to the appreciation of the beauty of a landscape, but, when it is possible to realise this beauty, and, in addition, to understand by means of geological knowledge how the landscape came into being, the effect is without question to heighten that appreciation. The glacial period was very drear and cold, but to it we owe the pleasing features of the East Anglian country, which, but for the activities of the glaciers and the torrential waters set free when these masses of ice melted, would have been quite flat and uninteresting.

The successful tracking of prehistoric man needs a trained mind and eye, and, as in all science, a well ordered imagination. An inexhaustible patience is also required, for Nature's secrets are only wrested from her with great difficulty, and often only after years of strenuous endeavour. The archaeologist, like all true followers of science, does his work not for material gain, nor worldly advancement, but because he loves the work for its own sake, and realises the supreme value of adding even one additional fact to the common store of human knowledge. Some of the specimens he finds might, if he is fortunate, be examples of ancient workmanship, in which both human skill and the artistry of Nature have combined to produce a thing of beauty. These, if correctly labelled and preserved in a cabinet, will always give pleasure as works of art, and, when interpreted aright, will enhance this pleasure by revealing a part of the stupendous history of man upon this planet.



## CHAPTER II

### *Man's Great Antiquity*

THE main object of this book is to draw attention to the richness of this country—especially that part of it known as East Anglia—in relics of prehistoric man and to trace his history and progress through the immensely long period of the Stone Age. For this purpose it will be needful to take a journey into the past, and to follow the human trail back to its far distant beginnings.

Thus we will pass without review the turbulent period of English history, and the activities of the Roman conquerors of this country, and come to a time when England was inhabited by a race of people who had come over from the Continent, whose principal occupation in life was the making of iron implements and weapons. As we go still further back in time we find Britain peopled by tribes of savages using weapons made of bronze, and practising the habit of burning their dead and putting the remains in urns, which were buried, mouth downwards, at a depth of two or three feet in the ground. Still more remote in point of time we come to an epoch when man had not yet discovered metals with which to make weapons, and we thus enter that very mysterious and interesting period known as the Stone Age.

The Stone Age is divided up into three periods: the latest is called the Neolithic, or New Stone Age: the more ancient the Palaeolithic, or Old Stone Age: while the most ancient of all is known as the Eolithic, or Stone Age of the Dawn.

The New Stone Age people entered England about 10,000 years ago, and a great deal is now known about them. They were very expert in flaking and polishing pieces of flint and other stone into axes, spear-heads, and arrow points; they practised a rudimentary agriculture, and generally buried their dead in sepulchral chambers made of stone, under large heaps of earth called tumuli of a more or less oval shape. These mounds are found scattered about upon the present surface of the ground in Yorkshire, Wiltshire, and other places, and the flint implements of this period can usually be discovered on ploughed fields and open heaths. If any of the New Stone



## MAN'S GREAT ANTIQUITY

Age people could revisit the scenes of their former activities, they would not see very many changes in the actual surface of the land, but it would be otherwise with the ancient Englishmen who lived in the Old Stone Age times. One thing is certain about these latter people: if they could come back to life they would never recognise the places where they made flint implements, and hunted big game, because, in the passage of time, these sites have either disappeared altogether, or have been buried deep beneath deposits of sand, gravel and clay. The world which the Old Stone Age hunters knew has gone never to return. We have now arrived at a point in man's past history where it is necessary to consult another branch of science, geology, which deals with the deposits forming the crust of the earth, and will enable us to form some idea of the age of the flint implements found in these deposits. We will then, in imagination, visit a brickfield where an Old Stone Age land surface has been found. This brickfield is situated on high ground, and we see, away to the west, a wide and deep valley separating us from the continuation of the high land on which we are walking. When we enter the brickfield, we proceed to examine a face of clay about 20 feet in depth, and our attention is drawn to a thin, dark, wavy line that runs along the section at about two feet from its base. Strange as it may seem, this dark line represents the land surface we have come to see, and at this level have been found, from time to time, very excellent Old Stone Age flint implements, together with large numbers of flakes struck off in the manufacturing process, hammer-stones with which the raw material was broken up and trimmed into the desired shape, and numerous bones of animals killed for food by the ancient hunters. We notice also that the humanly flaked flints, during the long ages since they were made, have changed colour, and, from being black or grey, are now either white, blue, brown, or yellow, and this colour change shows that the specimens are very old. Having seen and grasped the meaning of this evidence, we begin to recognise that above the old land surface are 12 feet of clay, which, by its horizontal bedding, was evidently laid down in water, and this is significant because we are standing on high ground where little, if any, water is to be found at the present day. Above the 12 feet of clay, we observe about 6 feet of another

## MAN'S GREAT ANTIQUITY

deposit, formed of a violently twisted and crumpled mass of sand, clay, gravel and pieces of chalk, and this, it is evident, was laid down when the climate was very cold, and ice and snow held sway in England. It thus becomes clear that since the Old Stone Age people inhabited their land surface very great changes have come over the scene, which have brought into existence a bed of clay 12 feet thick, and a condition of cold climate such as, fortunately, does not prevail here now. There is, however, still a further surprising fact to be realised, for, as we leave the brickfield and approach the wide and deep valley to the west, we see that the old land surface under the clay is cut off by this valley, and when we see that the same land surface is found on the other side, we recognise that at one time the clay and the ancient land surface were continued across what is now a valley 120 feet deep and a mile wide,<sup>1</sup>

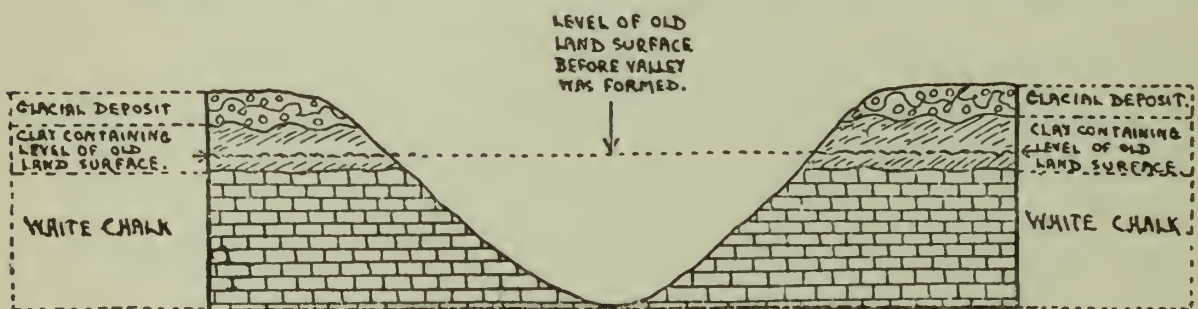


Fig. 1. Diagram showing position of ancient land surface in clay on either side of a valley. Since this land surface was occupied by man a considerable thickness of deposits has been laid down over it and a wide and deep valley formed.

and that this great trench has been cut out by water action since the people lived whose remains are found below the clay (Fig. 1). This examination has thus shown us that an ancient land surface where man once lived is now buried beneath, first of all, clay, and then material brought along by an ice-sheet, and that after then a near-by valley a mile wide and 120 feet deep has been cut out by water action, and we realise that all this cannot well have been done in a short time, in fact it is clear that a very great lapse of time must have taken place since these Old Stone Age people lived on their land surface, and we wonder how many years have passed away since those days. In trying to decide that, we must try and measure time, not in the ordinary way as when we say, "that occurred 20 or 50 years ago," as this measure will not help us in the present case. We have seen that the men of the New Stone Age

<sup>1</sup> Smith, W. G., *Man the Primæval Savage*, Edward Stanford, London.



## MAN'S GREAT ANTIQUITY

entered England 10,000 years ago, and that since then no changes worth considering have taken place in our land surface. But it is otherwise with the Old Stone Age people, and, looking at it from every standpoint, we can safely conclude that several tens of thousands of years have rolled by since they existed. Though the example given above of the great antiquity of man is impressive, yet even this pales to insignificance when compared with the evidence of that antiquity afforded by the discovery of flint implements in the Pliocene strata of eastern England. These discoveries are dealt with in later chapters, and it will be seen that, since man first appeared in East Anglia, enormous changes in the configuration of the land, great alterations in climate, and in the type of animals inhabiting the country have taken place. Let us, for a moment or two, consider the relation of these things to the question of the antiquity of man. The earliest vestiges of human beings in Suffolk are found in a stratum beneath the Red Crag, and there is no doubt, for reasons that will be given later, that these people were existing in a tropical climate. We can imagine them living their lives upon a land surface which had as much an appearance of permanence as that upon which we exist has to us to-day. It is in the highest degree probable that these early East Anglians inhabited their land surface for an infinitely longer period than is represented, for instance, by the time covered by English history, and if we had been able to discuss the matter with them, we would have found that they were convinced of the permanency of the conditions under which they lived. Yet, we know that the land surface they inhabited is now buried deep under deposits of different ages, and the country they knew so well has been for ever obliterated.

It may be said that there is no evidence whatever that the disappearance of the ancient pre-Red Crag land was accomplished quickly, in fact there is every reason to believe that the very reverse was the case. For the deposit which now covers this land surface was laid down by the sea, and by the condition of the shells it contains, and from other considerations, we know that the land was sinking very slowly. It is evident, also, that the climate was gradually changing, and becoming colder, and as year after year passed, marked by an advance of the sea over the gradually sinking land, together with increasing cold and

## MAN'S GREAT ANTIQUITY

wet and ever-lengthening winters, the human and animal inhabitants of East Anglia would, by insensible degrees, move further and further south where conditions were more to their liking. In the days of which I speak, England was not an island, but joined to the Continent, and there existed a land route leading southwards. As I have said, the southern trek would have been carried out by insensible degrees, and it may well have taken twenty thousand years for a transference of the human and animal life of Suffolk and Norfolk to, for instance, a region no further south than the Mediterranean area. It is clear that man was not exterminated altogether, because we know that, after an arctic sea had finally inundated East Anglia and laid down widespread deposits of shelly sands, the land was once more upheaved, and, in the beds laid down during this period of re-emergence, we find abundant evidence of both human and animal life. These great changes of climate and migration of animals occurred no less than four times in the Eastern Counties—and, of course, in other parts of the world as well—and no one who knows of these things, and has seen with his own eyes the clear evidence of them, can entertain any doubt as to the immense periods of time that are indicated.

It must be remembered, too, that man inhabited East Anglia only in the warm interglacial epochs, when conditions were favourable for his existence.

During the age-long domination of the ice, Suffolk and Norfolk must have been devoid of human beings, who had gradually moved south to a warmer climate.

It may be supposed that the gap of time between the makers of the flint implements found beneath the Red Crag and those in the Cromer Forest Bed was, in all probability, at the least fifty to one hundred thousand years. That is to say, that the submergence of East Anglia beneath the waters of the Red Crag Sea, and its final re-elevation as a land surface, occupied the amount of time mentioned, and during this period eastern England was uninhabited.

There can be no doubt that the pre-Red Crag people were existing somewhere to the south, and slowly evolving their flint implements into better and more useful types, and by a comparison of the implements found beneath the Red Crag with those in the Forest Bed which represents the workmanship of



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the next invaders of East Anglia after Red Crag times, we can form some idea of the rate of progress in implement-making in prehistoric days. Now, when a comparison is made of the two series of flint implements mentioned, it is at once observable that the artifacts from the Cromer Forest Bed exhibit an advance both in technique and in form from the pre-Red Crag specimens.

Further, the former are evidently related to the latter, and represent a distinct carrying on or extension of the pre-Red Crag culture. But, while this is the case, the advance shown is after all comparatively slight, and this fact demonstrates that even during the passage of fifty to a hundred thousand years the rate of progress in human affairs in prehistoric times was extraordinarily small.

The conclusions arrived at from a comparison of the pre-Red Crag and the Cromer Forest Bed flint implements can be drawn, further, as to the later main stages of Stone Age times which were also separated by prolonged glacial episodes, and exhibit an equally small progressive movement.

Thus, on every side the evidence accumulates pointing to the profound antiquity of man on this earth: an antiquity which must be reckoned in many hundreds of thousands of years.

Having thus seen reason to believe that the earliest relics of man on this earth are exceedingly old, we will proceed to consider another and equally important question, viz. How is it known that these flaked flints, of which so much is made, have been shaped by man? In the days of the Stone Age, when nearly every implement and weapon in use was made of this material, flint must have been as indispensable as coal is to-day.

Flint is the fifth hardest substance in nature, and occurs, in its natural state, in the chalk (an ancient marine deposit laid down towards the end of the Secondary Period) in the form of nodules of varying size and shape, and sometimes in tabular masses of considerable extent. The silica of which flint is formed, was present in suspension in the waters of the chalk sea, and, by some means, was deposited round certain objects—such as sponges and shells lying on the floor of that sea. This process accounts for the production of nodular flints, but fails to explain, satisfactorily, the manner in which the tabular variety was formed. As these tabular masses are often found resting at varying angles in undisturbed chalk, and not lying

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horizontally, it seems probable that they were not formed upon the level floor of the sea, but came into existence after the chalk was upheaved as dry land. Flint in company with obsidian (a volcanic glass) and ordinary glass, has a conchoidal, or shell-like fracture, and when a certain type of blow with a steel hammer, or hard stone, is delivered, preferably in the centre of the surface of the block of sound flint, and the surrounding areas afterwards gently tapped, it will often be found that these areas will fall away revealing a symmetrical cone of flint produced by the blow. When detaching flakes from another stone, it will be observed that these exhibit immediately beneath the spot where the blow fell (known as the "point of impact") a rounded protuberance, and that a corresponding hollow is present upon the core from which the flake was struck. This protuberance represents part of the cone of percussion formed by the flake-removing blow. A further examination of the bulbar surface of the detached flake will show that, very often, upon some part of the bulb of percussion is to be seen a small flake-scar detached simultaneously with the flake upon which it appears. This small flake-scar is known as an *écaillage*, but the exact reason for its detachment is unknown. The flake will also, in all probability, exhibit a series of ripple-marks centering round the point of impact, and also a series of curious splits, or fissures, which radiate from the same point. The ripple-marks may be, in a way, compared with the ripples set up in water by the jarring effect of any heavy object thrown into it, but in the case of water the ripples disappear, while with flint they remain as a permanent feature of the flake's surface. The splits or fissures are due apparently to the tearing effect of the blow.

These various characteristics of the surface of a flake removed by a blow (they are sometimes present in a less marked degree upon flakes detached by pressure) are shown diametrically in Fig. 2. As regards the manner in which flint can be flaked, it will be found that if you select, for instance, a potato-shaped stone, and hold it in your left hand, while you give it a sharp blow near either end with another flint or other hard stone held in your right hand, you will knock off a good-sized piece, and that a smooth, flattish surface will be present where the break occurred. Then, if you deliver blows with your hammer-



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stone round the edge of this striking-platform—as it is called (Fig. 2)—flakes will be detached, and these will have a very sharp, razor-like edge. This is the way in which prehistoric man flaked his flints, and made them into implements and weapons for various purposes. But, though it is possible to thus flake flint by delivering blows upon it with a hammer-stone, it can be broken in other ways as well. For instance, if we get a good

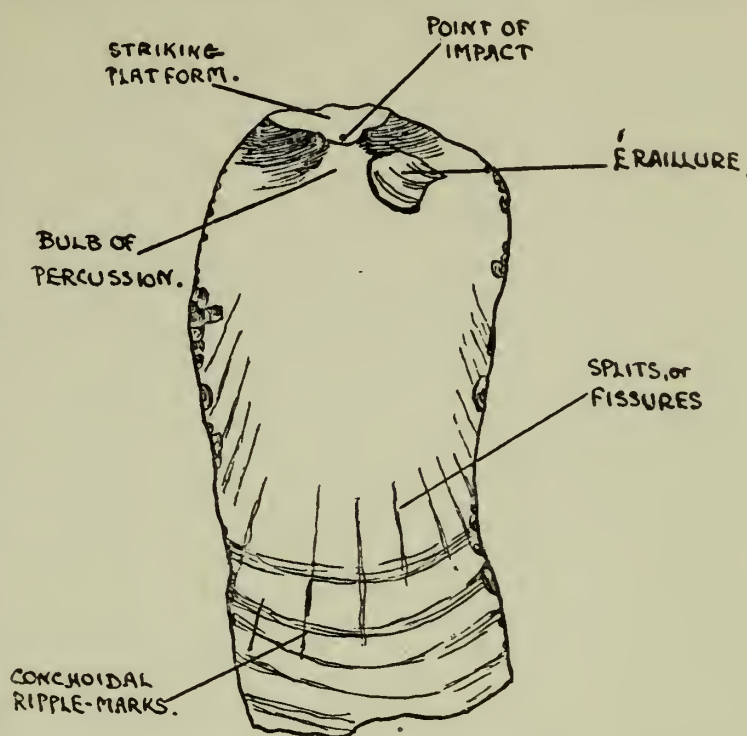


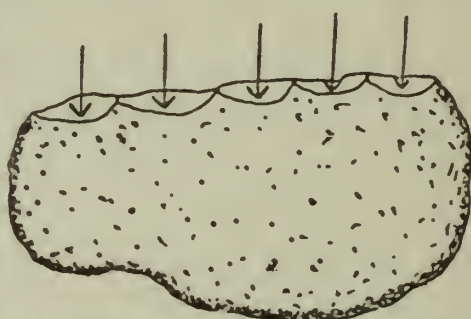
Fig. 2. Diagram showing characteristics of the bulb-bar surface of a flint flake produced by percussion.

strong sack and put in about twenty flint nodules, and swing and shake the sack about so that the flints inside are continually hitting each other, we would find that this treatment breaks many of them, and a large number of flakes would be produced in the experiment. Or, again, we might get an ordinary letter-press, and if we placed a flint upon the floor of the press and then screwed the ram down with increasing force upon the stone we should almost certainly break it by pressure. Then, lastly, we might place a flint in a hot fire, and we should see that after a time there would be a loud crack and the flint would fly into several pieces. Now, it is necessary to realise that Nature can flake flints in similar ways to those I have described, she can rattle them about in a turbulent stream or on a sea-beach, and so remove flakes from them, as we did in our sack; she can break them under a heavy weight of ice, or other materials, as we accomplished in the letter-press; and finally, by means of extreme sun heat, and by frost, she can fracture them as we did when we put a stone in the fire, but these forms of fracture bear no real resemblance to those produced by human blows. And so the problem that now confronts us is this—How is it possible to tell that any particular flint we may find, has been flaked by man, or by the unguided forces of Nature? It may be said at once that it is very difficult, if not

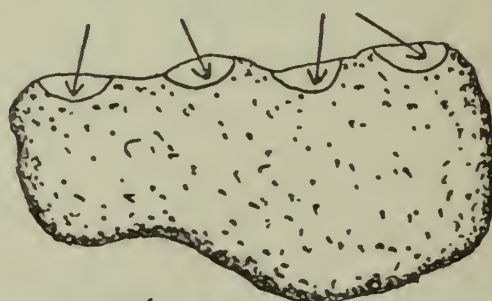


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impossible, to tell in every case if any single flaked flint of a primitive, simple type is the result of human intention or natural fracturing, such as is caused by pressure or percussion. But, when one can examine a large series of such stones from any given locality, it is generally possible to say to which category they are to be referred. The flaking produced by natural pressure sometimes simulates human workmanship very closely. But this mode of fracture seldom results in the production of well-formed bulbs of percussion and the other characteristics of intentional flaking. Pressure, in most cases, removes very thin flakes of flint, and the edge-flaking so produced has a characteristic, featureless appearance. Further, this form of fracture very often results in the production of two cones of percussion at either end of a flake, where pressure and resistance have acted, and this, so far as my knowledge extends, has never been seen upon flakes detached by human blows. As will be readily agreed, the work of Nature in flaking flints must always be of the haphazard order, and cannot be directed to any desired end. This will become apparent if we compare the flints we have broken in our experiments with others which we know have been shaped by man into various forms of implements. In the former class we notice nothing but rough, meaningless forms, while in the other we see that the specimens have a finished appearance, and show clearly by their shape and signs of use that they have been made for definite purposes such as chopping, cutting, or scraping. Further, if we look closer at the latter group, we will see that it contains many examples made on the same general and complex plan, and it will be agreed that this is an attainment beyond the powers of unguided, natural forces. Finally, our examination will show us that, when we scrutinise a flint implement, it is obvious that,



MAN'S WORK - FLAKES REMOVED IN A CONSTANT DIRECTION.



NATURE'S WORK - FLAKES REMOVED IN VARIOUS DIRECTIONS.

Fig. 3. Diagrams showing one of the chief differences between human and natural flaking. The arrows indicate the direction of the flake-removing blows.

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in making the specimen, its maker so directed his blows that the flakes were struck off in an orderly sequence (Fig. 3) so that the desired form of weapon or tool was obtained, and we realise that this was emphatically not the case with the results of Nature's handiwork.<sup>1</sup> The method adopted to ascertain the direction in which any given flake has been removed from a flint is as follows:

A line is drawn down the centre of the flake-scar, and at right angles to the ripple-marks. Then two other lines are drawn, one on each side of the central line, and also at right angles to the ripple marks as they curve upwards. The three lines are then continued to their point of junction, which point indicates the area upon which fell the blow that detached the flake. The correctness of this method can be checked by observing the direction of the small fissures or splits often seen on flakes, which radiate from the point of impact, and afford an additional indication of the direction of the flake-removing blow. But, in addition to all this evidence, there remains other testimony to tell us that these implements are indeed the work of man. In many cases they are found surrounded by hundreds of flakes, equivalent to the shavings we have all seen in a carpenter's workshop, removed in the process of making the specimens. With these flakes are often found hammer-stones used in the flaking process, and by these signs it is clear that we are dealing with an actual workshop site of prehistoric times, where the manufacture of flint implements was carried on. Then, remains of ancient fires are sometimes found at such places, together with animal bones split open for the extraction of marrow, and all these things show beyond a doubt that the flaked flints—upon which so many of us rest our scientific reputation—are veritable works of man. But the final and overwhelming proof of this is when we find with the implements an actual skeleton of one of the people who made them. These flaked flints then are clearly of a remarkable age, and were undoubtedly made by man, and these important matters having been cleared up, we can proceed in the next chapter to learn something about the earliest flint implements known to science, which were made by a race of ape-like people living in Kent, perhaps a million years ago.

<sup>1</sup> Moir, J. Reid, *Pre-Palaeolithic Man*, Harrison, Ipswich.



### CHAPTER III

#### *The Most Ancient Works of Man*

IN the previous chapter we discussed the question as to whether these old flint implements are actual works of man, and as ancient as archaeologists imagine, and so we can now turn our attention to the most primitive and ancient flint implements, representing man's first attempts to provide himself with tools and weapons other than his hands. But before doing so, it is necessary to elucidate certain questions which have an important bearing upon the matter with which we are dealing.

Geologists have divided up the rocks forming the crust of the earth into four great periods, viz. Primary, Secondary, Tertiary, and Quaternary—or First, Second, Third, and Fourth. In East Anglia, the deposits open to examination are the upper part of the Secondary formations, and those of the Tertiary and the Quaternary epochs. The Tertiary beds—as is the case with the other great geological formations—have been sub-divided into the Eocene (the most ancient of the Tertiary deposits), Oligocene, Miocene, and Pliocene periods, and, in East Anglia, the accumulations of the latter epoch are fortunately well represented, while those of the Quaternary age—which includes the Glacial Period—are also present there in abundance. We need not trouble ourselves about the Primary and the Secondary rocks because human beings were not in existence at those immensely remote epochs. But it is otherwise with the Tertiary stage, because in certain deposits of this period we come upon the first vestiges of man.

Another matter that needs explanation is the names given by archaeologists to the various phases of man's prehistoric past. These names are derived usually from the places where the different types of flint implements were first discovered. For instance, the Chellean specimens as they are called were first found at Chelles, on the River Marne in France.

I give below in two separate columns and in descending order, beginning with the most ancient, the various cultural phases of prehistoric times met with in East Anglia, and the

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names of the different types of implements referable to these phases:

Cultural phases	Types of flint implements
EOLITHIC	Kentian, Cantalian, and Darmsdenian
PRE-PALAEOLITHIC or PRE-CHELLEAN	Icenian { Implements from below the Red and Norwich Craggs
LOWER PALAEOLITHIC	Chellean, Acheulean, and Mousterian
UPPER PALAEOLITHIC and TRANSITIONAL	Aurignacian, Solutrean, Magdalenian, Azilian, and Tardenoisian
NEOLITHIC	Maglemosian, Campignian, and later types

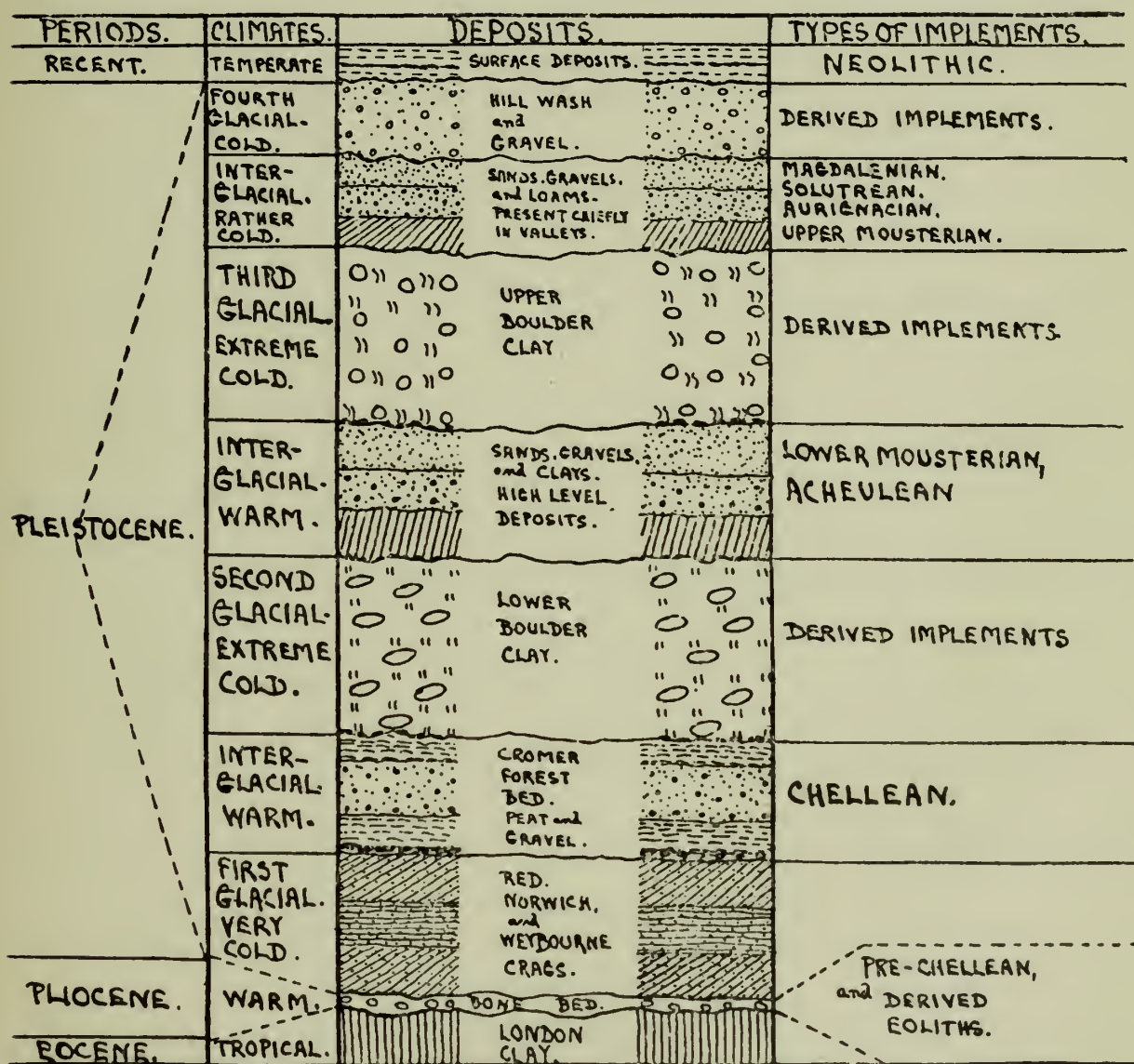


Fig. 4. Diagrammatic section of implementiferous deposits of East Anglia showing the geological age of the various types of flint implements and their relationship to the four stages of the Ice Age.

As the above names will be used frequently in these pages, the above table will make clear to which period any specimens are being referred, while Fig. 4, which shows the implementiferous deposits of East Anglia arranged in their proper sequence, indicates the geological horizon at which these



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specimens were found, and the climatic changes that have affected this area in the past.

These things being made clear, we will in imagination journey down into Kent and take up our position on the summit of the North Downs, with our faces to the south, and looking out across the great expanse of the valley of the Weald. The place where we are standing is about 700 feet above the sea, and if our eyes are good, and the weather clear, we can see, far away in front of us, the Downs which form the southern boundary between the Weald and the sea.

After having admired the scenery to the south, we will now turn round, and have a look northward. When we do this we

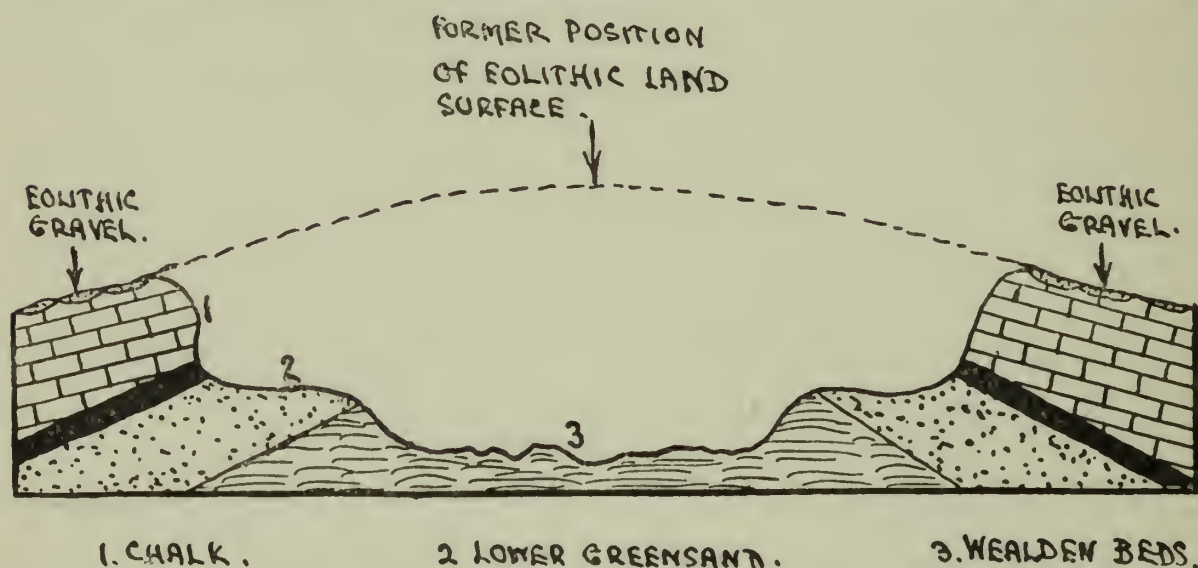


Fig. 5. Drawing to show the North and South Downs, and the Weald of Kent. The makers of the Eoliths lived upon the high chalk dome (indicated by dotted line) that at one time extended over the Weald. Immense denudation has thus taken place since these primitive people existed.

notice we are standing on a long slope, which runs downward to the north, towards the Thames, and, if on a magic carpet we could transport ourselves to the summit of the Downs near the sea, and across the Weald of Kent, we should find ourselves again standing on a slope, only in this case it would run towards the south, that is, in exactly an opposite direction to the slope on which we are standing. The position can be made quite clear if we make a small mound of earth or sand and in the centre cut out a trench which divides the mound into two portions. This trench represents the Weald, while the remains of the mound on either side represent the North and South Downs respectively, and, in both cases, the mounds were at one time complete, and not cut in half as we now see them

(Fig. 5). If we were to dig down to a depth of a few feet in the ground upon which we are standing, we should find a deposit of iron-stained gravel containing many stones. This gravel was laid down by water, and the streams that deposited it must evidently have flowed down the slope on which we are standing. But the higher ground from whence it came has entirely disappeared, and where it at one time existed there is now the great, far reaching valley of the Weald. It is obvious that this gravel must have been laid down at an immensely ancient epoch, for, since then, the slow action of rain, frost, heat, and the sea has removed an enormous mass of deposits many hundreds of feet in thickness. This great denudation resulted in the formation of the Weald, and left the North and South Downs standing up on either side of it. The archaeological excavations that have been carried out by the discoverer of the Eoliths, Mr W. B. Harrison, and others,<sup>1</sup> in this ancient gravel bed at the summit of the North Downs, has shown it to contain the earliest and most primitive flint implements known to science. These are called the Eoliths—signifying stones of the Dawn—that is, the dawn of human intention. They are very roughly flaked, and are usually made from pieces of flint, with two flattish surfaces, and are about half an inch thick. These surfaces, which presented naturally-produced striking platforms, have not been modified, but the edges have been extensively flaked, and these edges were used for cutting, scraping and hacking purposes (Fig. 6).

The flaked portions of the specimens are usually of a dark mahogany brown colour. This is due to the enormous time they have lain in the red gravel in which they are found, and apart from any other evidence, speaks eloquently of their antiquity. The Eoliths, when newly made, were quite sharp and effective for the work they had to do, and were evidently used as scrapers for removing the fat from skins, while some were probably attached to shafts and utilised for warlike purposes. It is difficult to conceive of any implement more simple than these specimens, which represent the type of artifact that would be made by a creature first learning to flake flints. It is probable that these flints were shaped by a race of ape-like people who lived on a land surface which existed at one

<sup>1</sup> Prestwich, Sir J., *Q.J.G.S.* for May 1889 and for May 1891.



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time over what is now the Weald of Kent, which was then enjoying a tropical climate, and strange and now extinct



Fig. 6. Eolithic flint implements found in Suffolk. *A* and *C* from the Suffolk Bone Bed beneath the Red Crag at Bramford, *B*, *D* and *E* from Glacial Gravel at Bolton & Co.'s pit, Ipswich.

animals roamed the land. There were great beasts of prey, huge elephant-like creatures, herds of deer, and wild and primitive horses. In the low-lying parts of the country were swamps with flocks of wild fowl, and immense forests and



jungles teeming with game of various kinds. This was in the latter part of the Tertiary epoch of the world's history, and it was in such a country that the makers of the Eoliths lived. They were probably small, squat men, with very ape-like skulls and projecting jaws, and in many ways more like animals than men. It is remarkable that they managed to survive in the contest with the many ferocious creatures with which they were associated—but these earliest human ancestors were no doubt very cunning, and by the superiority of their brains over those of the animals their survival was made possible.

The human origin of the Eolithic, Kentian, flint implement has been in dispute for a great number of years, but the weight of opinion is now in favour of the view that they were artificially flaked, especially as they are seen to conform to the criteria of man's work upon flints. The primitive appearance and profound antiquity of these specimens make them of the greatest interest to students of prehistoric man.

Though, as has been shown above, there is very good reason to believe that the Eoliths of the Kent Plateau are of a very great antiquity, yet the gravel in which they are found is not covered by any other deposit such as would enable us to say, with certainty, that this gravel is of a particular geological age. It is fortunate, therefore, that examples of Eoliths, quite comparable with those discovered in Kent, have been found in Suffolk, in the detritus, or bone bed, below the Red Crag, thus showing that the very ancient people who made these implements inhabited East Anglia.<sup>1</sup> Now the Red Crag is a very well known deposit, and is, it would seem, referable to the beginning of Quaternary times. Further, it is certain that the detritus bed beneath it is definitely older than the Red Crag, and contains, among others, specimens of various kinds that date back to the early Tertiary period. The Eoliths found beneath the Red Crag (Fig. 6) exhibit, in nearly every case, marked signs of transport, and had evidently had a long history before arriving in the bed where they are now found.

They are also obviously much more ancient than the other flint implements with which they are associated, and so it is

<sup>1</sup> Moir, J. Reid, *Proc. P.S.E.A.* vol. III, pt 3, Figs. 25 and 25 A.

possible to say that these earliest Eolithic flints must date back to a very remote and far-distant period.

The Eoliths are thus, evidently, of an extreme antiquity, and represent the most ancient works of man yet brought to light. In my opinion also these specimens show us the basic forms from which all later flint implements were derived, and I have been able to trace the manner in which the Eoliths developed into the later sub-Red Crag forms<sup>1</sup>, and these, in their turn, to the still more advanced Palaeolithic specimens<sup>2</sup>. It cannot be too strongly urged that the evidence now to hand demonstrates the orderly development of flint implements from the very primitive Eoliths to the latest, symmetrical forms in use at the end of the Stone Age, and that this development, indicating as it must the slow, though sure, advance of man himself from a rudimentary pre-human state, provides further support, if such were needed, to Darwin's great theory of evolution.

Eolithic flint implements have been found in gravel underlying boulder clay in the brickfield of Messrs Bolton and Co., Ltd., Henley Road, Ipswich:<sup>3</sup> in a deposit of the same age exposed in the old excavations to the east of Foxhall Hall, near Ipswich: and in the sub-Red Crag detritus bed in the brickyard of Messrs A. Coe and Co., Ltd., Bramford, near Ipswich.<sup>4</sup> The Eolithic specimens in both the gravel and the detritus bed are, however, to be regarded as derivatives—washed from a pre-existing land surface of which no traces can now be found.

Some years ago I discovered at Darmsden, near Needham Market, Suffolk, a series of remarkable flint implements that are closely allied in form, and are possibly of a similar antiquity, to the Eoliths found in Kent and elsewhere.<sup>5</sup> The pit in which these specimens occur is situated upon the farm of Mr William Wilson of Darmsden Hall. The excavation is on the plateau to the west of the River Gipping, and stands at a height of about 180 feet above the sea. The deposit thus pre-dates the formation of the Gipping Valley, and is evidently of a very high antiquity. Beneath the London Clay of Suffolk and other parts of the country there are very often to be found beds

<sup>1</sup> Moir, J. Reid, *Pre-Palaeolithic Man*, Harrison, Ipswich.

<sup>2</sup> Moir, J. Reid, *Phil. Trans. B*, 1919.

<sup>3</sup> Moir, J. Reid, *Proc. P.S.E.A.* vol. I, pt 3, pp. 307-319.

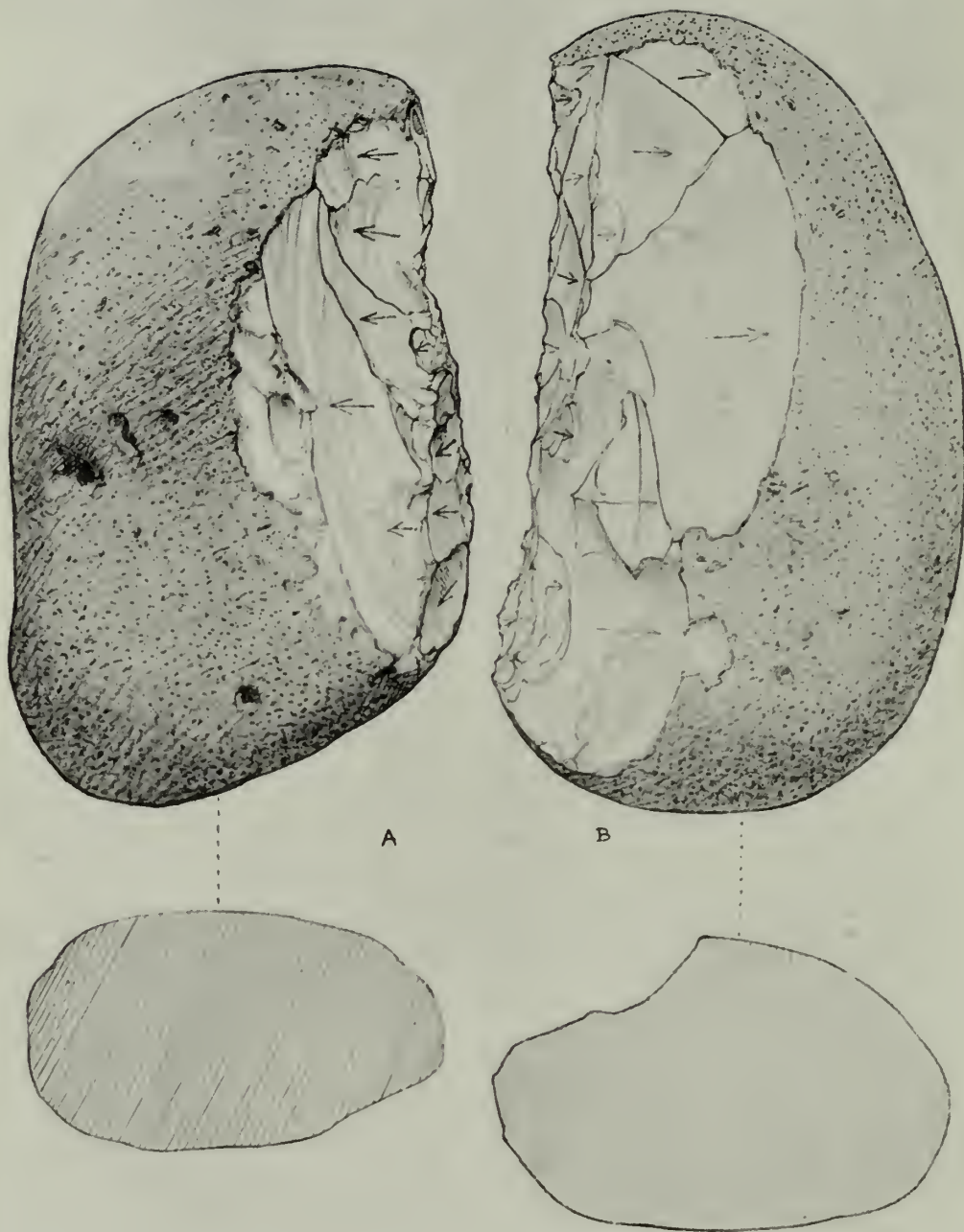
<sup>4</sup> Moir, J. Reid, *Proc. P.S.E.A.* vol. III, pt 3, Figs. 25 and 25 A.

<sup>5</sup> Moir, J. Reid, *Proc. P.S.E.A.* vol. II, pt 2, pp. 210-213.





PLATE III



*A.* Eolith found in glacial gravel at Darmsden, Suffolk  
*B.* Similar specimen made by the author. ( $\frac{5}{11}$ .) *P.S.E.A.*



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containing large numbers of rounded flints of a blackish colour. These pebbles are of Eocene age, and are therefore referable to a period much older than any in which flint implements have been found. The Eocene flints are also very tough and intractable, but it is from these that the Darmsden implements are made. The gravel at this place is about 8 feet in thickness, and is composed almost entirely of Eocene pebbles, and it must be concluded that some race of Eolithic people had access to an exposure of these specimens, which they proceeded to flake into suitable forms, and that, afterwards, these flints were carried by water action to their present position. Fortunately, most of the flints, in their natural state, have one surface which is more or less flat, and this surface was utilised as a striking-platform upon which the ancient flint flakers were able to deliver flake-removing blows, and so produce the implements required. These take the form of specimens with hollows for scraping, points for boring, and some large examples used, evidently, for chopping purposes (Plate III A).

In each case, the natural rounded surface of the pebble was used for holding in the hand, and there is little doubt that these specimens must have made quite efficient implements for the primitive uses to which they were put. The flaked surfaces of the Darmsden flints are coloured a rich chestnut brown which contrasts very markedly with the black hue of the unflaked portions of the specimens. The antiquity of these implements is, as has already been mentioned, attested to by the position of the deposit in which they are found at Darmsden, and this conclusion receives further support in the fact that many examples of these specimens have been found beneath the Red Crag in Suffolk, thus showing that they belong to some part of the remote Tertiary period. A discovery made many years ago at Puy Courney, in the Cantal,<sup>1</sup> Central France, may give us a more satisfactory knowledge of the real age of these earliest vestiges of man. As has been shown, the Kentian Eoliths are, from the position in which they are found, presumably of a great antiquity, and this view is supported by the finding of specimens of comparable types below the Red Crag of Suffolk. Regarding even these specimens, however, it is only possible to say that they are definitely older than the Red Crag that

<sup>1</sup> Sollas, W. J., *Ancient Hunters* (3rd edition), pp. 91-98, Macmillan, London.

surmounts them. But they exhibit manifold signs of rolling by water action and, it is clear, had a long history before their arrival in the bed where they are now found. This deposit contains mammalian and other remains referable to several periods pre-dating the Red Crag, and the question arises as to which of these epochs the specimens of Kentian type belong. The same uncertainty must be expressed also as to the real age of the Darmsdenian implements. This question is of great importance, as the Eolithic specimens represent, without question, the most primitive type of flaked flint of implemental form so far discovered, and must be associated with the first attempts of intelligent beings to shape flints to their needs. Thus, if we could assign a definite geological age to these specimens we would, in so doing, be fixing with considerable accuracy the momentous period when man appeared on this earth. It is, therefore, of great interest to realise that at Puy Courny, in Central France, there is present a bed of gravel of Upper Miocene Age (the epoch immediately preceding the Pliocene) containing a large series of examples of cherty flint that assume very definite Eolithic forms. A vast collection of these specimens was made by the late Mr Ernest Westlake of Fordingbridge in Hampshire, and some little time ago, in company with Professor W. J. Sollas, F.R.S., and Mr Henry Balfour, F.R.S., I was privileged to make a close examination of Mr Westlake's series, to which, however, attention had already been called by Sir Ray Lankester.<sup>1</sup> This examination showed clearly that Mr Westlake had got together an entirely comprehensive collection comprising all the types of flaked specimens found in the gravel bed. I may say at once that the result of my examination of this material was to incline me to regard it as a unique, and supremely important collection of very primitive implements. There were present numbers of large tabular masses of flint from which flakes had been detached, in many cases all round their margins. These flakes had then been trimmed into various simple forms such as scrapers and points, while some of the larger blocks of flint had been caused to assume a rough rostro-carinate shape. There were present also certain stones of a pyramidal type showing battering at the apex, which I believe were used as hammer-

<sup>1</sup> Lankester, Sir E. Ray, *Phil. Trans.* May 1912.



stones, and lastly, none of the specimens was much rolled or abraded, thus showing that they are, in all probability, to be referred to the period during which the gravel was laid down, viz. to that of the Upper Miocene. There cannot, fortunately, be any doubt as to the age of this deposit because in it have been found the remains of the following Upper Miocene animals, *Dinotherium giganteum*, *Mastodon longirostris*, *Rhinoceros Schleiermacheri*, and *Hipparion gracile*. The specimens in the Westlake collection impressed me strongly with their very primitive appearance, and I think it probable that they are comparable with the oldest series recovered by me from below the Red Crag of Suffolk. If this view is correct, then we can at last form some idea of the age of these earliest human implements, and realise that they must be referred to the end of the very remote Miocene epoch. Though the above represents my considered opinions on this matter, I do not wish to suggest that they are necessarily shared by my colleagues, Professor Sollas and Mr Balfour, who examined the Westlake Collection with me, and I believe that my distinguished friend Professor Henri Breuil, who has also seen this collection, regards the specimens it contains as of natural, rather than as of human, origin.

## CHAPTER IV

### *East Anglians of 500,000 Years Ago*

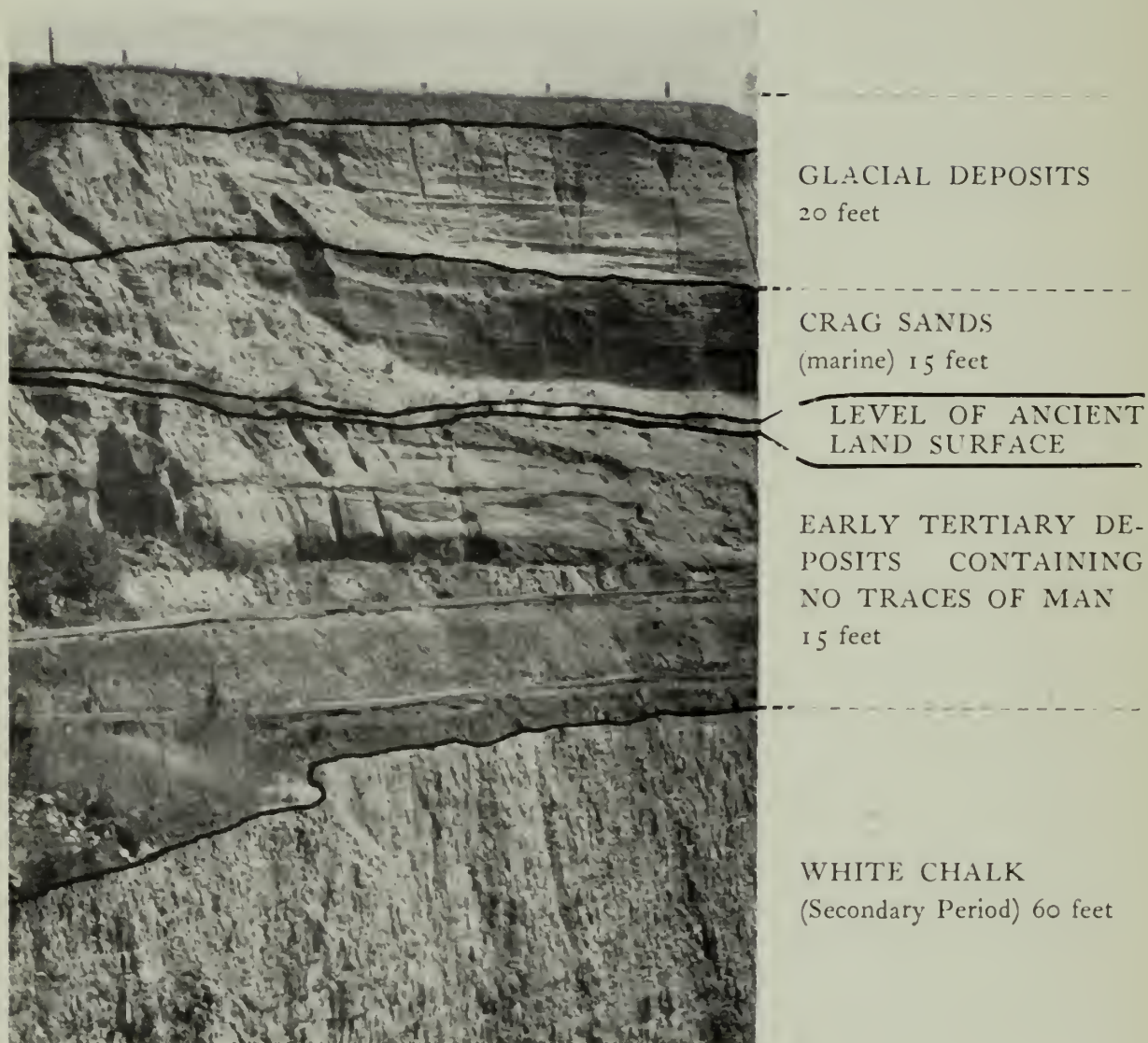
**I**N this chapter we are to visit Suffolk, to learn something about the people who lived on a very ancient land surface there towards the close of the Tertiary period of the earth's history—about 500,000 years ago. Suffolk is a very interesting part of the country, from the geological and archaeological standpoints, for within its borders is to be found a series of remarkable geological deposits, containing remains of early man not readily found in other parts of the country. If we could have journeyed into East Anglia at the time of which I speak, we would have found ourselves in a country of wide plains covered by scrub and jungle, with many streams and open stretches of water. The climate of those days was very warm, and we would have shown a keen interest in the many strange animals disporting themselves upon the ancient Suffolk land surface.

We would have watched herds of huge elephant-like mastodons forcing their way through the undergrowth, and marvelled at the strange appearance of the hipparion, or three toed horse, the deer, bears, rhinoceroses, hyaenas, pigs, tapirs, and other creatures of those days. But the most impressive scene of all would have been an encampment of the ancient East Anglians of Pliocene times. There is no doubt that this land surface upon which these ancient hunters lived existed for an immensely long period, but, at last, it began to sink slowly beneath the waters of the sea. It is possible that this submergence went on at the rate of about two inches in a century, but, in the course of time, large tracts of East Anglia were inundated, and deposits, laid down by the sea, heaped up on what had previously been dry land. As will be realised, when this process was going on any objects lying on the land surface would be quietly swept into the hollows and depressions existing in it, and in proof of the correctness of this supposition it is in such hollows that these objects are now found. The shelly marine sands which now cover most of this old land surface are known as the Red Crag, but before their deposition there was laid down upon the





PLATE IV



VIEW OF PART OF LARGE PIT AT BRAMFORD, NEAR IPSWICH  
showing position of ancient pre-Crag land surface beneath glacial and marine deposits

surface of the submerged land the sand of a sea containing large and beautiful shells such as are now found existing only in far southern waters. The deposits of this Coralline Sea, as it is called, show that the waters were warm, but the later incursion of the waters of the Red Crag period swept away most of the Coralline beds, which exist only as isolated patches at Tattingstone, Orford, Sutton, and Aldeburgh in Suffolk. The sands of the Red Crag are of a dark red colour, and their arresting appearance, when contrasted with the vivid green of the fields and hedges—especially when lit up by the rays of the setting sun—is one of the chief glories of the Suffolk landscape. And it is at the base of the Red Crag, separating it from the more ancient London Clay below, that there are found, in a deposit known as the detritus bed or Suffolk Bone Bed, about 18 inches in thickness, composed of materials of differing ages ranging from the end of the Secondary period to the latter part of the Tertiary, the bones and teeth of the animals I have mentioned and the flint implements of the men who hunted them (Fig. 9).

Thus, as will be recognised, the bed containing these remains has always been of great interest to scientific men. It was in 1910<sup>1</sup> that I was so fortunate as to find humanly flaked flints in this deposit, and when this discovery was made—as is usually the case in such matters—I found that there were some archaeologists who were unable to believe that these flints had been shaped by man. But since 1910 many extensive excavations have been carried out beneath the Red Crag of Suffolk, and have resulted in getting together an overwhelming mass of evidence which has caused it to be very generally recognised by many authorities, including an International Commission of Experts, that a race of flint-flaking people lived near the shore of the ancient Red Crag sea, and that their flint implements and other relics were buried beneath marine deposits as the waters of this sea advanced over the slowly-sinking land surface of London Clay.<sup>2</sup> The sea beneath which the East Anglian land was submerged in Red Crag times was evidently getting gradually colder, as an examination of the shells contained in the Crag shows that as we pass from the youngest to

<sup>1</sup> Moir, J. Reid, *Proc. P.S.E.A.* vol. I, pt 1, pp. 17-43.

<sup>2</sup> Moir, J. Reid, *Proc. P.S.E.A.* vol. II, pt 1, pp. 12-31, and other papers.



## EAST ANGLIANS OF 500,000 YEARS AGO

the oldest layers of this deposit, an ever-increasing number of the remains of cold water shell-fish are present. The East Anglian land was rising to the south and sinking towards the north, and so the oldest layers of the Red Crag occur in the north of Essex, while the youngest are found in Norfolk, and, as the submergence of the land continued, a land bridge which had hitherto existed to the north was broken through, or submerged, and the cold waters of the Arctic Ocean, hitherto kept out, poured into the Crag basin. It is clear, however, that these cold conditions differed very greatly from those present when the land surface below the Red Crag was inhabited by

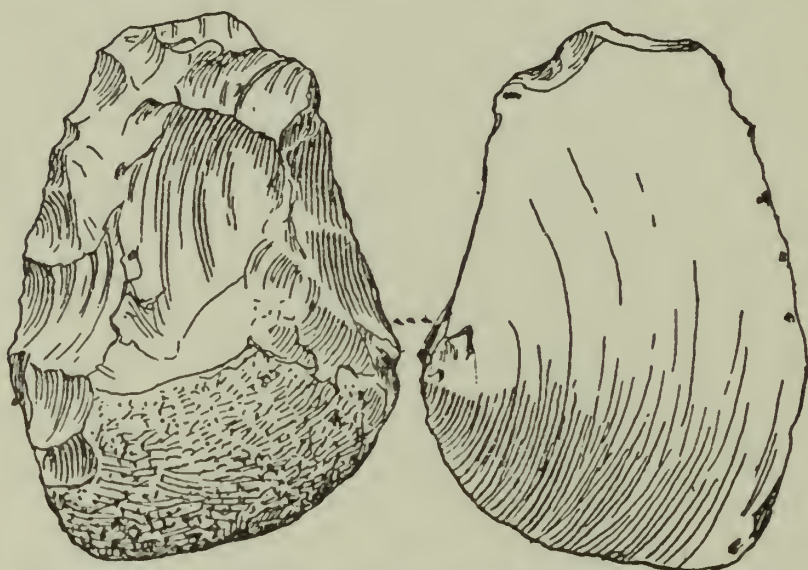


Fig. 7. Flint side-scraper from below the Red Crag at Bramford, Ipswich. (Nat. size.) *P.S.E.A.*

man. For on that surface we find the remains of warmth-loving animals—showing that the climate must have been warm, and in fact sub-tropical. The flint implements left upon this ancient land surface enable us to realise that, while still very primitive, man had already advanced beyond the condition of life of the makers of the Eoliths which were described in the last chapter. The Icenian (a name derived from that of the ancient tribe of the Iceni of East Anglia) implements from beneath the Crag show a much greater variety of types than were present in Eolithic times, and the manner in which they are made shows unmistakably that man was becoming more skilful in flint flaking. Thus we find definite side-scrapers as they are called made from flakes, one of the longer edges of which was neatly chipped to provide a reliable edge for scraping purposes (Fig. 7), equally definite pointed specimens

EAST ANGLIANS OF 500,000 YEARS AGO

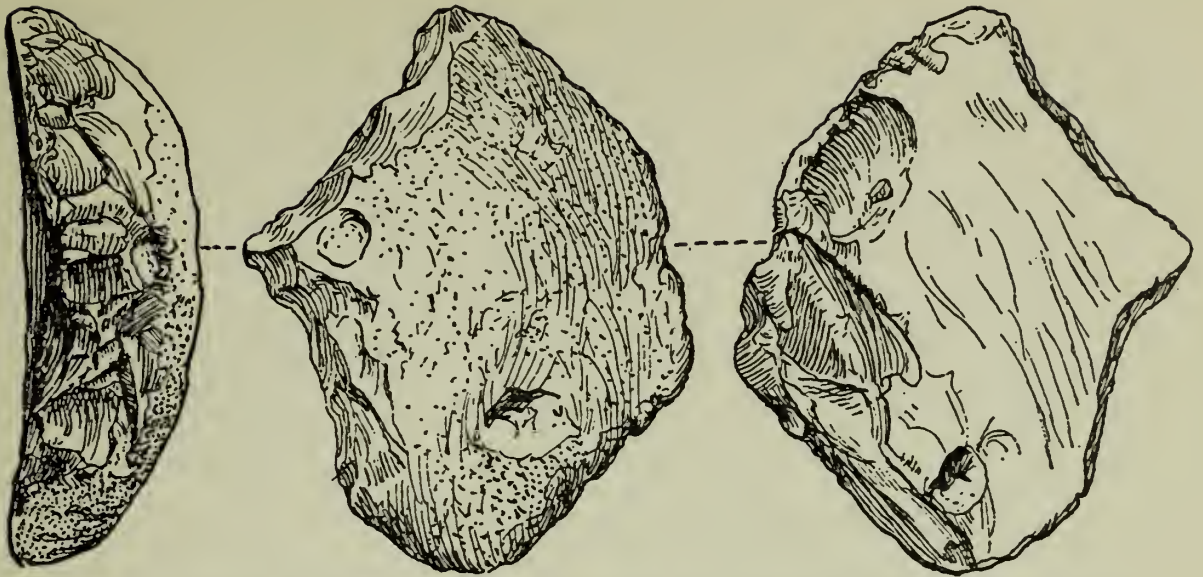


Fig. 8. Pointed implement from below the Red Crag at Bramford, Ipswich.  
(Nat. size.) *P.S.E.A.*

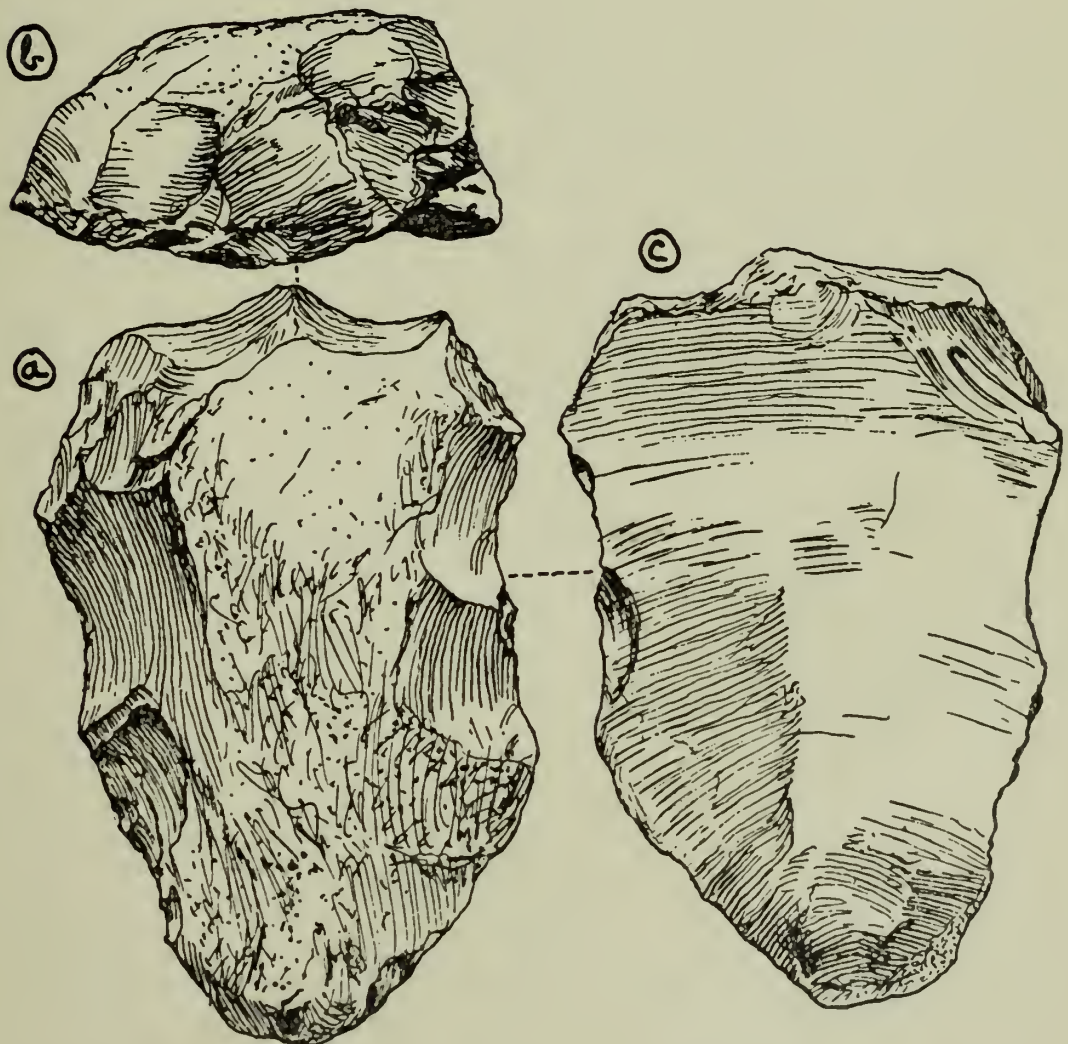


Fig. 9. Flint scraper from below the Red Crag at Bramford, Ipswich.  
(Nat. size.) *P.S.E.A.*

and trimmed flakes for boring, piercing and cutting (Fig. 8), flint choppers for smashing bones, and well made scrapers (Fig. 9) and rubbers used in dressing skins. The outstanding



## EAST ANGLIANS OF 500,000 YEARS AGO

type of implement below the Crag is, however, one in which one end has been flaked in such a manner that it resembles the beak of a bird of prey (Fig. 10). Some of these beak-shaped

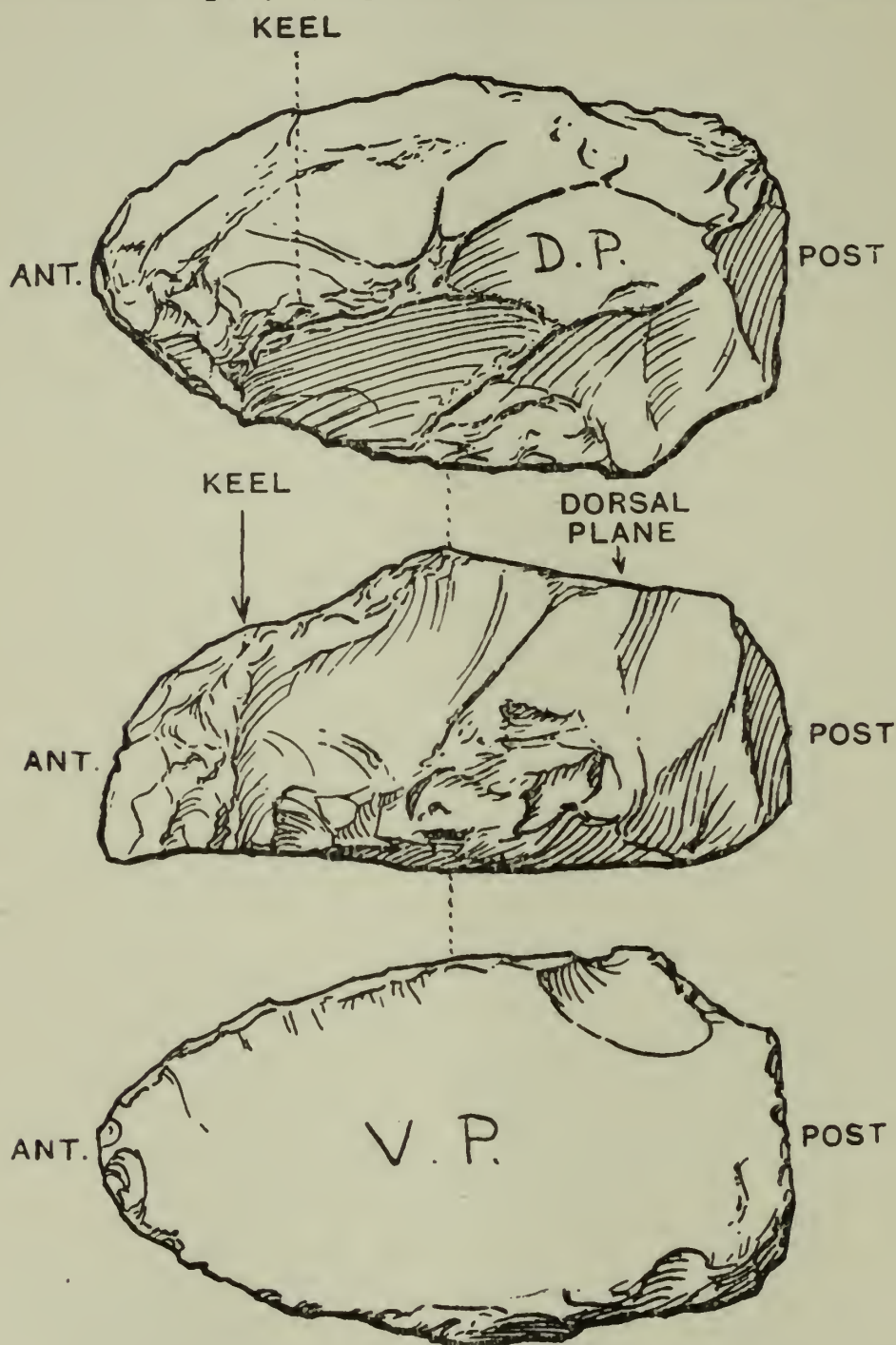


Fig. 10. A rostro-carinate implement (the Norwich Test Specimen) found beneath the Crag at Whitlingham, Norwich. D.P.=dorsal platform. V.P.=ventral platform. (Two-thirds nat. size.) R.A.I.

specimens are of considerable size, and must have been formidable weapons in the hands of prehistoric man.

Sir Ray Lankester gave to them the descriptive name of rostro-carinate,<sup>1</sup> and there is no doubt that these implements are of much scientific importance as they form the connecting

<sup>1</sup> Lankester, Sir Ray, *Phil. Trans. B*, 1912.



link between the very primitive Eoliths of pointed form and the later Palaeolithic hand-axes.

I have discussed this matter in detail in some of my published papers,<sup>1</sup> but it may be said that, in making a pointed Eolith by means of flakes removed from either side of one or other end of the stone, a carina or "keel" was inevitably produced. The section of the pointed end of such an implement is necessarily triangular—the base of the triangle representing the more or less flat under-surface of the Eolith—while the apex represents the carina or keel. The strength and suitability of such a sharp ridge for cutting and scraping purposes was evidently recognised by the early flint-flaking people, and its development and extension led on to the production of the rostro-carinate implement.<sup>2</sup>

The section of these specimens was also triangular, and was transformed into the rhomboidal section of the Palaeolithic hand-axes by replacing the flat under-surface of the rostro-carinate by a cutting-edge opposite to the keel. The manner in which the Palaeolithic hand-axes evolved is shown clearly by their forms which, in many cases, are very similar to that of the rostro-carinate type (Fig. 11). In some instances, these hand-axes exhibit a triangular section in which the apex of the triangle is of low elevation, and these may be regarded as merely depressed rostro-carinates in which the keel has ceased to be a functional part of the implement, and the cutting-edges are situated at the two lower angles of the triangle.

Thus, not only is the ancestral form from which the Chellean and Acheulean hand-axes were derived found below the Red Crag, but it has been of much interest to me to recognise other types in the Bone Bed that clearly foreshadow the evolved examples of these types met with in later deposits. Occasionally one finds a flake with thick, curving-back and more or less straight cutting edge—prophetic of the Abri Audi implement of much later times. Flat-based planes, with steep edge flaking, inevitably suggest to one's mind the genesis of the Aurignacian culture, while without question definite scrapers made from flakes, such as were used throughout the Stone Age, are present in the sub-Crag Bone Bed. There are

<sup>1</sup> Moir, J. Reid, *Phil. Trans. B*, 1919.

<sup>2</sup> Moir, J. Reid, *Pre-Palaeolithic Man*, Harrison, Ipswich.

## EAST ANGLIANS OF 500,000 YEARS AGO

very few, if any, flint implements whose development cannot be more or less plainly traced, and this development is generally very gradual, and its origin exceedingly remote.

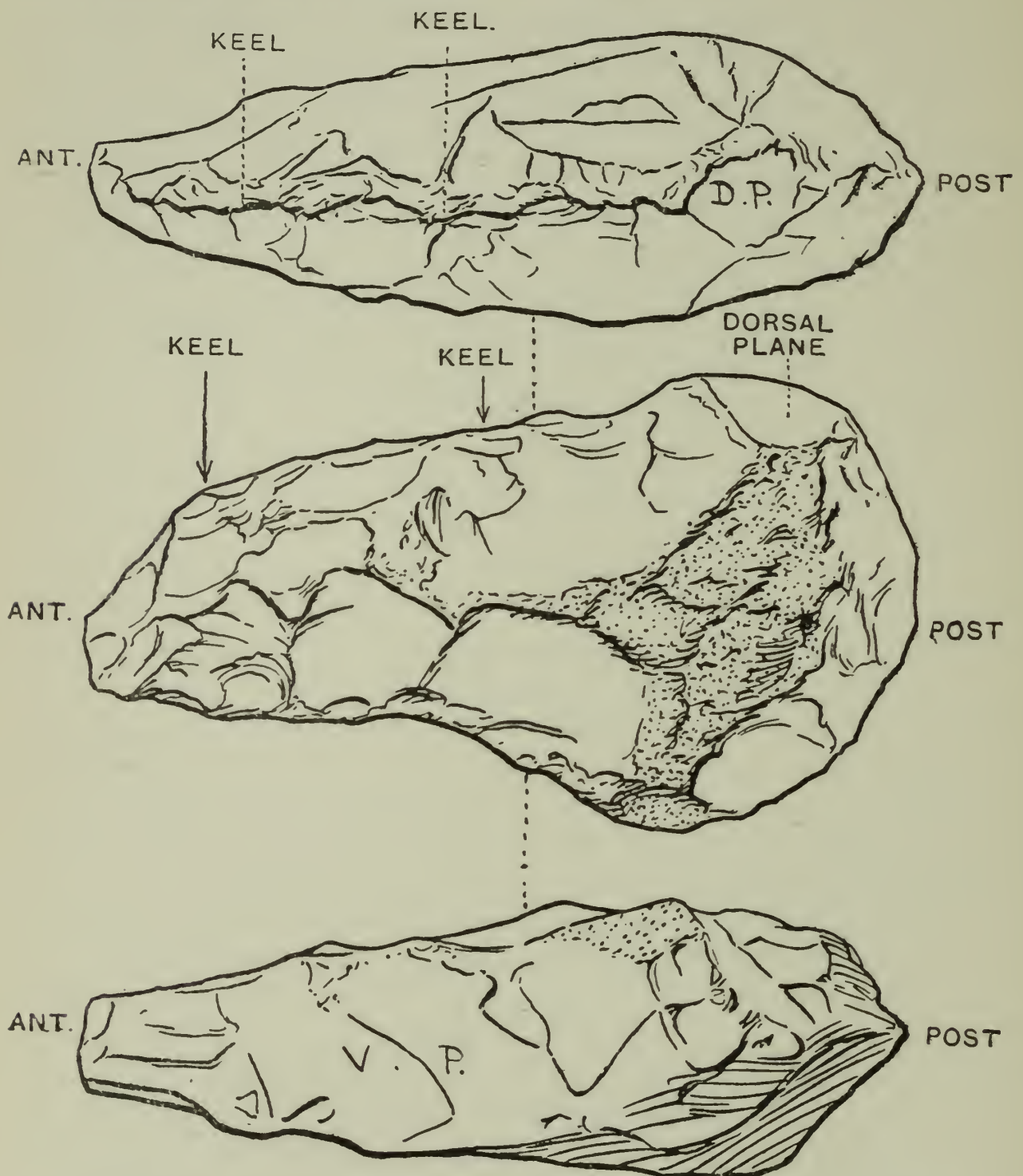


Fig. 11. Early Palaeolithic implement of rostro-carinate form, from gravel at West Drayton in the Thames Valley. D.P.=dorsal platform. V.P.=ventral platform. (Two-thirds nat. size.) *R.A.I.*

An examination of the sub-Crag specimens, which are generally of a rich, dark, mahogany brown colour, shows that in many cases they exhibit scratches, imposed by glacial conditions, upon their surfaces after they were flaked and



patinated, and were made by heavy though skilful blows which detached large flakes from the flint which was being shaped. Unfortunately, no actual bones of the people who made these implements have yet been discovered, but, judging from these specimens, we conclude that their makers were possessed of considerable strength, and represent an early and brutal stage in human evolution. The occurrence of flints beneath the Crag which show, by their burnt and crackled appearance, that they have been subjected to great heat, seems to demonstrate that these ancient people had learned how to make fire, and, if so, this knowledge was thus a very remote achievement of the human race. It is an impressive experience to be able to dig out the flint implements of these people who lived before the laying down of the Red Crag began in Suffolk, to see the type of tools they used, and to realise how they flaked them for certain definite purposes. There is no doubt that most of these specimens were not hafted but were used in the hand, and thus, as many of them are so obviously adapted for this purpose, it is possible to gain some idea of the size of the hands of their makers, and to imagine how their fingers must have arranged themselves round the stone.

But to find these implements it is generally necessary to remove a large amount of overlying material (sometimes the specimens are found 50 feet from the surface) and to be prepared to work in, and to cope with, much water when the level at which the specimens occur has been reached. Because the Red Crag rests, generally, upon London Clay which holds up the moisture percolating down from the surface, and this water at times makes impossible any systematic excavations.

In the sub-Red Crag Bone Bed, where these flint implements are found, there are a number of bones comprising, chiefly, pieces of whale rib, very highly mineralised. Among these I have found certain specimens that have every appearance of having been shaped by man.<sup>1</sup> Such pieces are of great rarity and assume, usually, a definite pointed form which cannot well have been produced by any natural, non-human, means. The "worked" portions of these bones show the same deep and ancient coloration of the other parts of the specimens, and experiments which I have carried out demonstrated that, in

<sup>1</sup> Moir, J. Reid, *Proc. P.S.E.A.* vol. II, pt I, pp. 116-131.

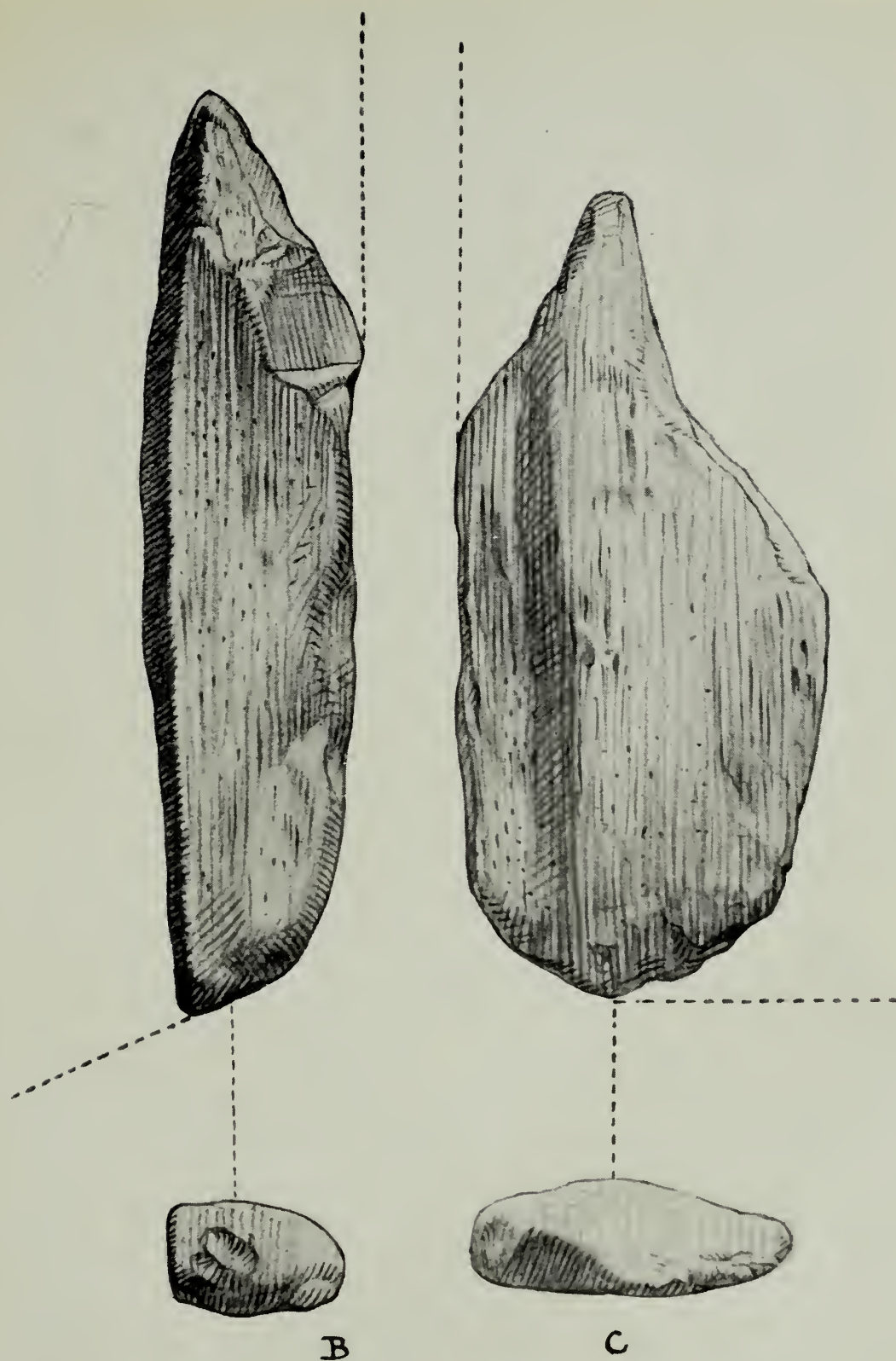


the present mineralised state of the bones, it is not possible to shape them to the forms they have assumed. In order to produce such forms from bone I found it to be necessary to operate on fresh specimens, and that these, by "flaking" and rubbing with a hard quartzite pebble, could be made into shapes quite comparable with those found below the Red Crag. I have little doubt, therefore, that these latter specimens have been shaped by man (Plate V), and represent the most ancient bone implements yet discovered. From the earliest days man would naturally make implements from bone and wood and it is my opinion, based upon other experiments which I have carried out—and described in a later chapter—that many of the flint implements of all pre-historic periods are admirably adapted for shaping such materials.

Though the Bone Bed below the Red Crag is of Tertiary age, the Crag itself must I think be referred to the Quaternary period of the earth's history. As has been shown, the shelly sands of the Red Crag were laid down by a sea encroaching upon a slowly-sinking land surface. This process was evidently not continuous, as is proved by a discovery I made at Foxhall, a place situated about  $3\frac{1}{2}$  miles to the east of Ipswich. Just south of Foxhall Hall is an old pit dug in glacial gravel overlying Red Crag, which represents one of the excavations made many years ago in search of the so-called "coprolite" found beneath the Crag. The coprolites are, in reality, rolled pieces of phosphatised clay, and were formerly ground up and used for fertilising purposes. When this was the case, large areas of Crag were excavated in East Suffolk, and the Foxhall area was one of the chief centres of this activity. In the year 1855 a human lower jaw-bone was said to have been found in the Crag at Foxhall Hall—at a depth of 16 feet from the surface, but the specimen, now unfortunately lost, was treated in those early days with somewhat scant attention, though fully described and illustrated in a paper written by Dr Robert Collyer.<sup>1</sup> It is, however, somewhat remarkable that I should have found at a depth of 16 feet from the surface in the Red Crag at Foxhall (Plate VI) the remains of two ancient and super-imposed occupation-levels where, it is conceivable, a human jaw-bone might have been found.<sup>2</sup>

<sup>1</sup> Collyer, Robert H., *Anthropological Review*, vol. v, pp. 221-229.

<sup>2</sup> Moir, J. Reid, *Proc. P.S.E.A.* vol. III, pt 3, pp. 390-441.



TWO PIECES OF HUMANLY-SHAPED BONE FROM BENEATH  
THE SHELLY RED CRAG, SUFFOLK. *P.S.E.A.*





VIEW OF WESTERN FACE OF FOXHALL CRAG PIT  
The position of two ancient occupation levels is clearly shown by the lines drawn across the section with a trowel.  
The Crag is here covered by about 12 feet of Glacial Gravel, *P.S.H.A.*



These old land surfaces are underlain and surmounted by the marine Red Crag, and the conditions indicate that a shore-line existing at this place, bordering the Crag Sea, was occupied by a flint-flaking people. It is evident that the gradual process of submergence then going on in East Anglia was, at this period, arrested, and it is probable that the state of equilibrium lasted for a considerable time, because at the 16-foot level were found manifold signs of man's former presence. The finds consisted of the débris of a flint workshop, and included hammer-stones, cores from which flakes had been struck, finished implements, numerous flakes, and several calcined stones showing that fires had been lighted at this spot.

The Foxhall implements are, in the majority of cases, of a yellowish white colour, and more finely made than the still more ancient specimens found at the base of the Crag (Figs. 12 and 13), and give us a very clear idea of the type of workmanship of which these ancient Suffolk people of Early Quaternary times were capable. While if the famous Foxhall human jaw-bone, which was apparently not very primitive in form, was, indeed, derived from the old land surface now buried deep beneath Crag and a great thickness of Glacial Gravel, we can form the definite opinion that these ancient people were not very unlike ourselves in bodily characteristics.

The equivalent to the Red Crag in Norfolk is a very similar deposit known as the Norwich Crag, and beneath it is found a stratum—containing many flints and bones of animals—in which the late Mr W. G. Clarke found and described flint implements in 1905.<sup>1</sup> This announcement was made four years before I discovered humanly flaked flints below the Red Crag in Suffolk, though Mr Clarke, at the time of his discovery, was not certain that his specimens were of undoubted pre-Crag age, yet this antiquity has now been established and so to him must be accorded the honour of being the first to find evidence of Tertiary man in England.

The Pliocene implements of Norfolk—of which many have now been recovered—differ in some ways from those of Suffolk, and, with experience, it is possible to distinguish clearly between the two series. One of the most famous sub-Crag specimens of true rostro-carinate form was found in the

<sup>1</sup> Clarke, W. G., *Proc. P.S.E.A.* vol. II, pt 2, pp. 213-229.

(A)



(B)



(C)

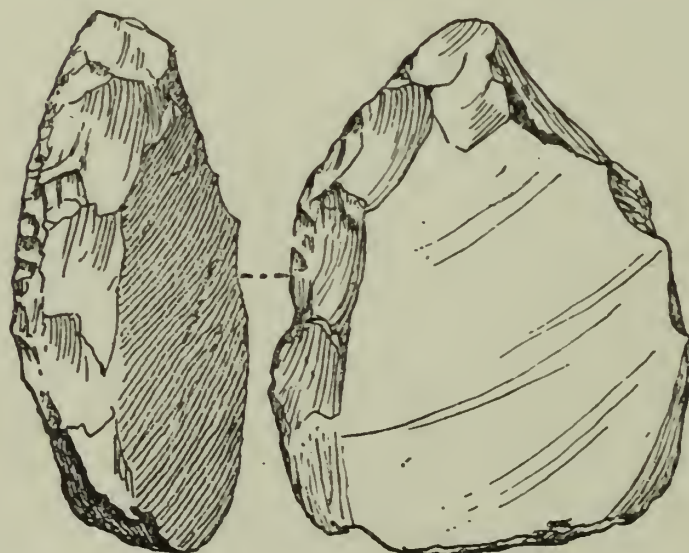


Fig. 12. Flint implements found in the Red Crag at Foxhall Hall, near Ipswich. A and B, points; C, side-scraper. (Nat. size.) *P.S.E.A.*



## EAST ANGLIANS OF 500,000 YEARS AGO

Stone Bed at Whitlingham, near Norwich, and has been described by Sir Ray Lankester under the title of "The Norwich Test Specimen".<sup>1</sup> The deposit known as the Stone Bed, in which the specimen was found, differs from the Bone Bed of Suffolk, in its constituents and the manner of its formation, but both accumulations have yielded evidence of supreme value in piecing together the history of early man upon this earth. The implements found beneath, and in, the

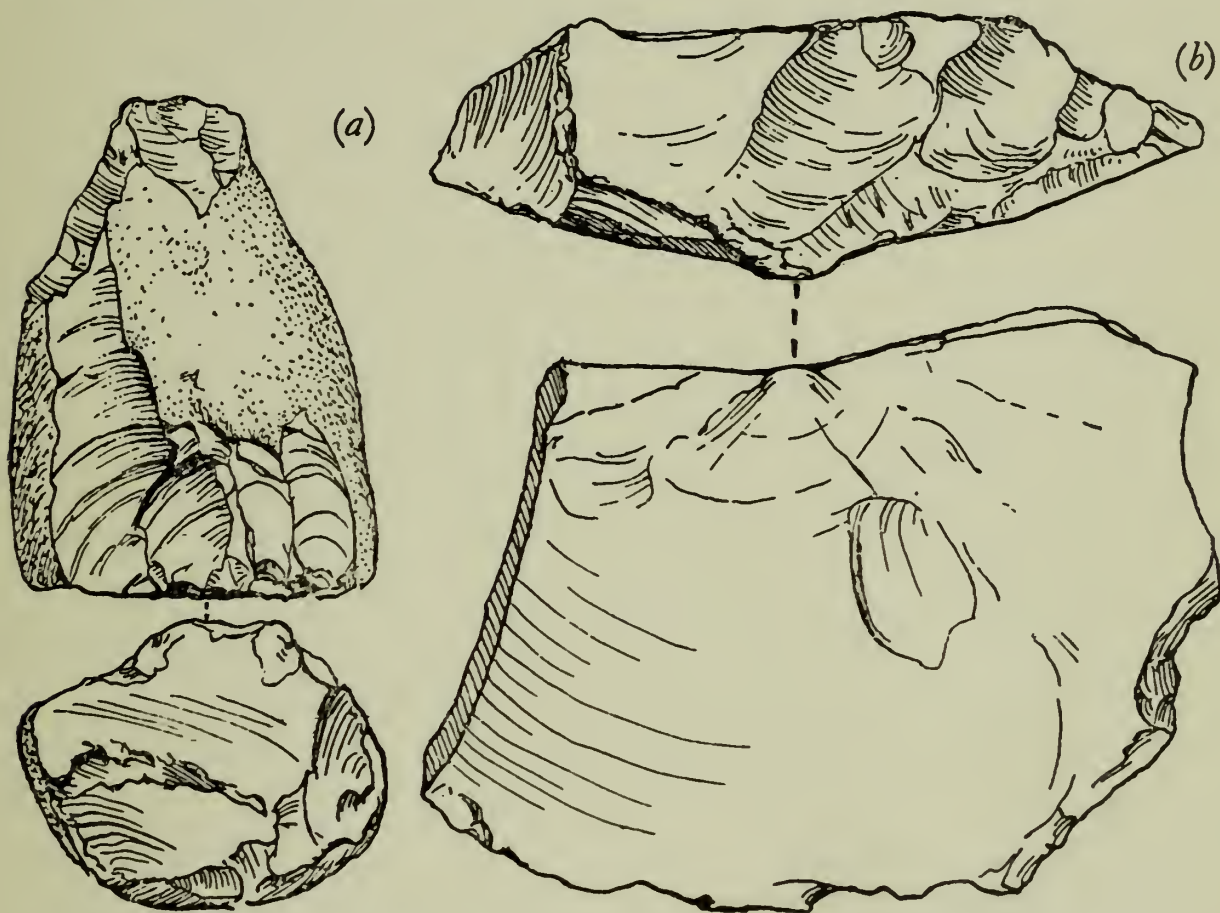


Fig. 13. Flint implements found in the Red Crag at Foxhall Hall, near Ipswich. (a) Core, (b) flake with faceted platform. (Nat. size.) P.S.E.A.

Red Crag are not Eoliths—a name that should be reserved for the specimens of Harrisonian type found in Kent and elsewhere—but form a connecting link between these primitive artifacts and the later Palaeoliths. I suggest, therefore, that the Crag implements should be called "Pre-Palaeoliths" or "Pre-Chellean" implements in order to distinguish them from the true Eoliths.

The antiquity of these ancient relics of man is, of course, enormous, as since they were made there have been several slow sinkings and risings of the land—three periods of extreme

<sup>1</sup> Lankester, Sir Ray, *Roy. Anthr. Inst.* "Occasional Papers", No. 4.



glacial cold, separated by epochs when the climate was evidently warm—and vast migrations of animals, the great majority of which have long since been eliminated in the onward march of evolution. We may be sure that all these changes took place with the slowness of most natural processes, and the deposit beneath the Red Crag containing the flint implements of these ancient East Anglians is thus of great scientific interest, and affords striking and conclusive proof of the antiquity of man on this planet. It is to be hoped that the further researches now being conducted in this bed may, before long, bring to light some human bones, and so enable us to see the type of man inhabiting England in the far off days of the Tertiary period.

The pre-Red Crag flint implements have been found at the following places:

*Bramford.* The two large pits at this place, which is situated about  $2\frac{1}{2}$  miles to the north-west of Ipswich, are in the occupation of Messrs A. Coe and Co., Ltd., who work them for brick making and lime burning. The Suffolk Bone Bed in these excavations rests below a considerable thickness of Red Crag Sand, surmounted by Glacial Gravel, with traces of Boulder Clay in the uppermost part. The pre-Crag implements found at Bramford are usually of a dark mahogany brown colour, and some exhibit a good deal of abrasion. There are, however, a few specimens from this place that are of a creamy white colour, similar to that of the implements found at Thorington Hall, Wherstead, and at Foxhall Hall.

*Ipswich.* On the north face of the brickfield of Messrs A. Bolton and Co., Ltd., Henley Road, Ipswich, are to be seen two gravel- and sand-filled hollows, in places capped by Boulder Clay, and at the base of the sand, resting upon the London Clay, a quantity of Bone Bed material is to be found. The area in which the brickfield lies has been subjected to disturbance by glacial action, and it is somewhat difficult to say if the pre-Crag deposit is actually *in situ*, but there can be no doubt that this accumulation is mainly of pre-Crag age as is indicated by its very definite character.

It was from this pit that nearly all of the pre-Crag implements of rostro-carinate type were recovered. These specimens are rare even in this area, and at other sites investigated

they are still less frequently found. The flaked surfaces of the implements from Messrs Bolton and Co.'s pit are, in the majority of cases, of a dark brown colour, and, as at other places, the pre-Crag specimens of a creamy white coloration have been made out of the dark brown examples; it is clear that the latter are more ancient than the former, and indicate the existence, at different periods, of two races of people in pre-Crag times.

The pit at the Back Hamlet in Ipswich is now closed, but formerly it showed some feet of very shelly Red Crag overlying the Bone Bed, which rested upon London Clay. Several well-made flint implements were recovered from below the Crag here during diggings conducted prior to 1914. The Crag at this spot is covered by Glacial Boulder Clay.

*Thornington Hall, Wherstead.* The pit at this place is situated about 2 miles to the south of Ipswich, and shows upwards of 18 feet of shelly Red Crag (with traces of Glacial Gravel and Boulder Clay above it) resting upon the Bone Bed which, in its turn, lies on London Clay. The implements found here are generally of a creamy white colour—while some have been made from specimens exhibiting the dark brown colour of the flints found at other pre-Crag sites. The Thornington Hall specimens are well made, and similar in their forms to those discovered at the 16-foot level at Foxhall Hall—and it is possible are of the same age.<sup>1</sup> Further, the Foxhall implements are also, in many cases, made from older specimens of a dark brown colour. But the former are found at an ancient occupation level *in the Crag*, while the latter occur in a bed *at the base of this formation*. Unfortunately, the great prevalence of water at Foxhall has prevented me from examining the Bone Bed lying at the base of the Crag there, but it was exposed in commercial diggings years ago, and was found to rest upon the Eocene London Clay. If this Bone Bed could be investigated it would, in all probability, be found to contain the dark brown implements mentioned. After the deposition of the Bone Bed, the land continued to sink, and the implementiferous level at Thornington Hall and the 16-foot level at Foxhall represent a land surface occupied by man, but at the latter place he lived

<sup>1</sup> Moir, J. Reid, *Natural History* (American Museum of Natural History, New York), vol. xxiv, No. 6, 1924, pp. 647-648.



upon Crag, while at the former the surface was composed of London Clay.

*Foxhall Hall.* This site has been already described (see pp. 32 and 33).

*The Nursery, Martlesham.* Martlesham lies about 5 miles to the north-east of Ipswich, and excavations carried out there in the horticultural nursery of Mr R. C. Notcutt resulted in the recovery of some typical examples of pre-Crag implements. The shelly Crag at this place is about 20 feet in thickness and is capped by a thin deposit of Glacial Gravel. The Bone Bed rests beneath the Crag and upon the surface of the underlying London Clay.



*The Men of the Cromer Forest Bed*

ABOUT 400,000 years ago great events were taking place in Norfolk. In the last chapter we were dealing with the very ancient East Anglians who lived upon an old land surface of London Clay, which was slowly submerged beneath the waters of the Red Crag Sea, and whose implements are now found in a thin deposit at the top of this clay and beneath the shelly sands laid down during the Red Crag period. I now want to carry the story of primitive man in East Anglia a step further, and to tell you about the human beings who existed at a later epoch in Norfolk, and whose characteristic flint implements are found at the base of a series of deposits known as the Cromer Forest Bed. Following upon the sinking of the East Anglian area in Red Crag times, and the consequent deposition of marine beds upon the London Clay, the land again rose above the sea, and these beds were, to a large extent, removed by the natural agents of transport, such as rain and wind, operating upon a land surface.

In the north-east portion of Norfolk this denudation, as it is called, was so extensive as to leave only a few feet of the Crag intact, while in places the whole of the Crag was removed, and the underlying Stone Bed, very rich in large masses of flint of fine quality, exposed. At this period the appearance of the land of the Norfolk district was very different from what it is to-day. In place of the wide North Sea and the high cliffs of the Cromer coast, was to be seen a broad and shallow valley, inhabited by herds of animals and also, as we now know, by parties of primitive men engaged in flint implement making and in hunting. In the valley of which I speak there flowed a northern extension of the present river Rhine,<sup>1</sup> and this river laid down the deposits which have been named the Cromer Forest Bed. This name was given to them because they are found, chiefly, near the town of Cromer, and because they contain a great number of roots and other parts of trees which flourished in Norfolk in this remote period.

<sup>1</sup> Reid, Clement, *The Pliocene Deposits of Great Britain*, 1890.

## THE MEN OF THE CROMER FOREST BED

The Forest Bed consists of three divisions, viz. a Lower Freshwater Bed, composed chiefly of peat; a Middle, or Estuarine, deposit, made up largely of gravel and sand laid down in the estuary of the ancient Rhine; and an Upper Freshwater Bed which, like the lower, is very peaty in its composition. One or other of these Forest Bed deposits are exposed, at places, from Kessingland in Suffolk to Weybourne in Norfolk, at the base of the cliffs, and upon the foreshore when the tide is low, and have for many years been examined and studied by geologists.

The work thus carried out has resulted in the getting together of a large number of fossil remains from the Forest Bed, and has enabled us to form a very accurate picture of the climate and animal and vegetable life existing in the ancient Rhine valley. We know, for instance, that the plants of those days were of a similar nature to those present in Norfolk to-day, but when we proceed to examine the bones and the teeth of the animals found in the Forest Bed, we realise that an enormous change has taken place since this epoch in the animal inhabitants of that part of the country. For in the Forest Bed have been found, among others, the remains of three different kinds of elephants (*Elephas meridionalis*, *E. antiquus*, and *E. primigenius*, the last being very rare), numerous forms of deer, the fearsome sabre-toothed tiger, a huge bear, rhinoceros, bison, the giant beaver, and last, but by no means least, a monkey. The presence of these remains in the deposits of the ancient Rhine show that the dead bodies of the animals they represent got into the river, and, as the flesh decayed, the bones fell to the bottom of the water and were covered up by the deposits then being formed. Now the animals I mention, with very few exceptions, are warmth-loving creatures, and it is clear that the climate of Forest Bed times was far from being cold, in fact we may regard it as, probably, almost sub-tropical. Into this well-watered, great game country wandered prehistoric man, and it must have been a very delightful and congenial place in which he found himself. Not only was the climate pleasant, and the animals which he wanted for food and other purposes plentiful, but there were also to be found, in the ancient valley of the Rhine, places where the Stone Bed at the base of the Crag was exposed and provided him with an



## THE MEN OF THE CROMER FOREST BED

abundance of first-class material from which to make his implements and weapons. The cliffs of the Cromer coast are being slowly worn back by the combined effects of underground springs of water and the action of the sea, and the foreshore now exposed at low tide was, not so very many years ago, covered by the cliffs. Fortunately, at the base of these cliffs, resting upon the chalk, is a deposit about 18 inches thick, formed of sand in which a great number of flints are tightly fixed owing to the large amount of salts of iron present in the deposit. This bed resists for a long time the action of the sea, and, at many parts of the coast, especially at East Runton, can be seen at low water as a more or less continuous

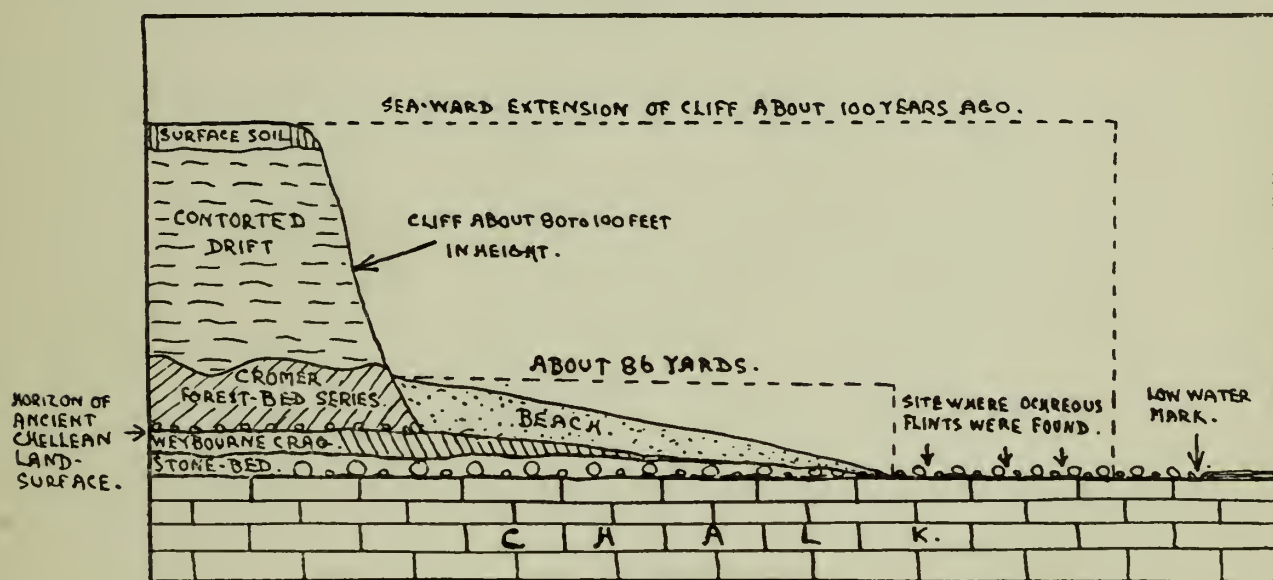


Fig. 14. Diagrammatic drawing of cliff, beach and foreshore at Cromer, showing relationship of the implement-bearing bed to the cliff deposits. R.A.I.

sheet covering the underlying chalk. But the continued attacks of the waves have the effect of gradually breaking up the deposit, and of leaving only the hard, resistant flints and other similar objects intact, and these now form large flint "spreads" which can be examined when the tide is at its lowest. The bed in which these flints occur represents the base of the Cromer Forest Bed, and contains numerous examples of the handiwork of the people who lived about 400,000 years ago in what is now Norfolk. The majority of the Cromer flint implements are of very large size, and this may be accounted for, partially, by the huge masses of raw material which the ancient flint flakers had at their disposal. Some two or three years ago I discovered, upon the foreshore at Cromer (Fig. 14), a place where, by the large number of implements and flakes present,

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I conclude that an actual workshop site of these remote people at one time existed.<sup>1</sup> Most of these specimens exhibit an arresting reddish yellow coloration upon their flaked surfaces, and this stain is due to the long sojourn of the specimens in

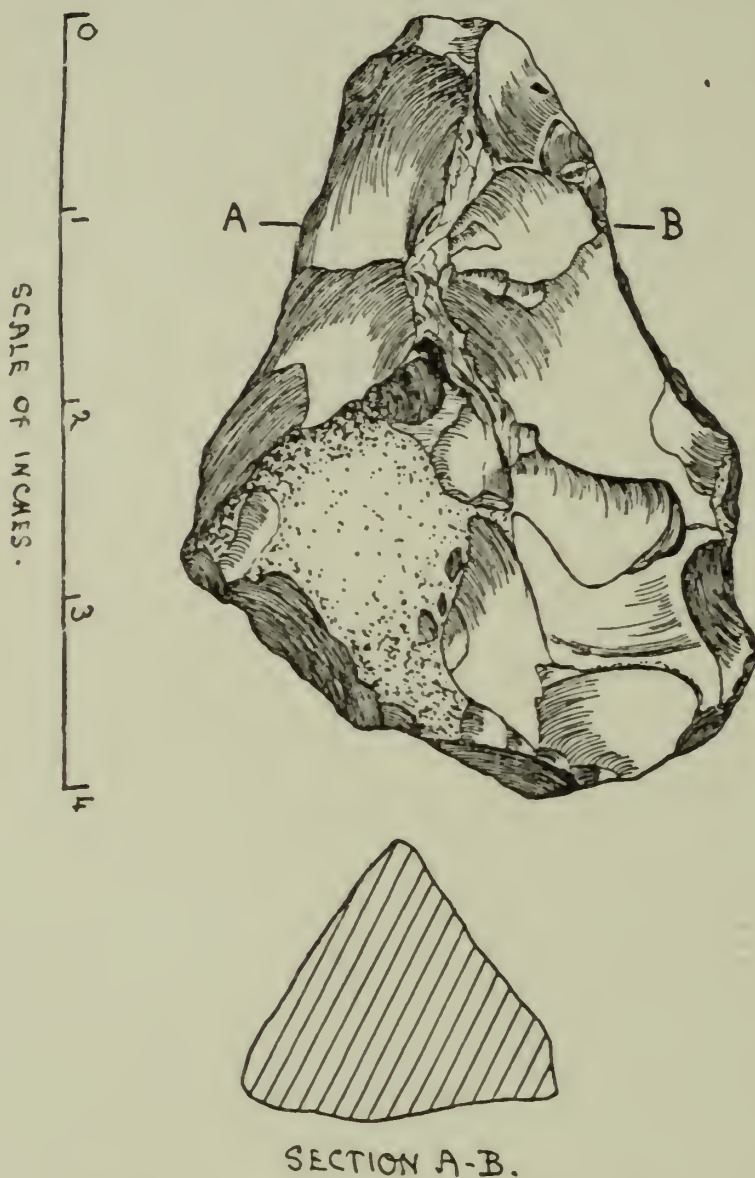


Fig. 15. Early Chellean hand-axe from the Cromer Forest Bed, Cromer. R.A.I.

the deposit, very rich in salts of iron, to which I have referred. A very striking example, exhibiting the typical coloration of the Forest Bed artifacts was picked up, some years ago, by Mr Randall Johnston on the beach at Palling to the south-east of Cromer. The Palling specimen is a well-made example of a Chellean hand-axe, and is now in the

<sup>1</sup> Moir, J. Reid, *Journ. Roy. Anthr. Inst.* vol. XLI, 1921, July to December; *The Great Flint Implements of Cromer, Norfolk*, Harrison, Ipswich; *Journ. Roy. Anthr. Inst.* vol. LV, 1925, July to December.



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possession of Mr A. C. Savin of Cromer. In the Bone Bed beneath the Red Crag the implements shaped at one end like the beak of a bird of prey are the dominant type, but in the later series from Cromer we see that this form is rarely met with, and that a roughly flaked implement of pointed form for

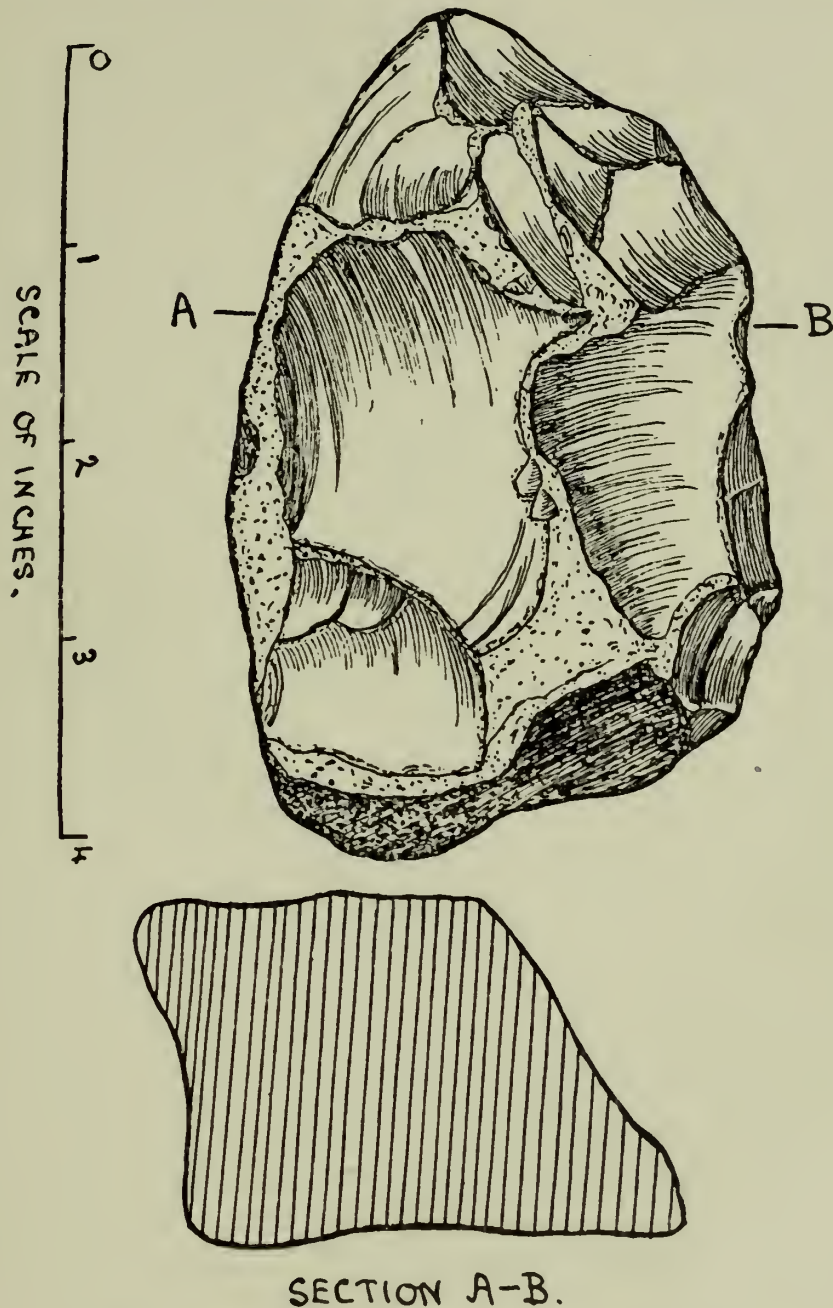


Fig. 16. Early Chellean hand-axe from the Cromer Forest Bed, Cromer. *R.A.I.*

holding in the hand has taken its place (Figs. 15 and 16). With these large hand-axes have been found choppers, scrapers (Fig. 17), and points (Fig. 18) of various and new kinds, and we realise by the presence of these implements that man's status in life, as compared with that of the older Eolithic and pre-Crag days, had considerably improved in the epoch

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with which we are dealing. It is clear also that these men of the Cromer Forest Bed must have used great strength and skill in flaking their flints, as is shown by the large size of the flakes detached in this process. Also, some of the implements found have been obviously hollowed out on either side by flaking,

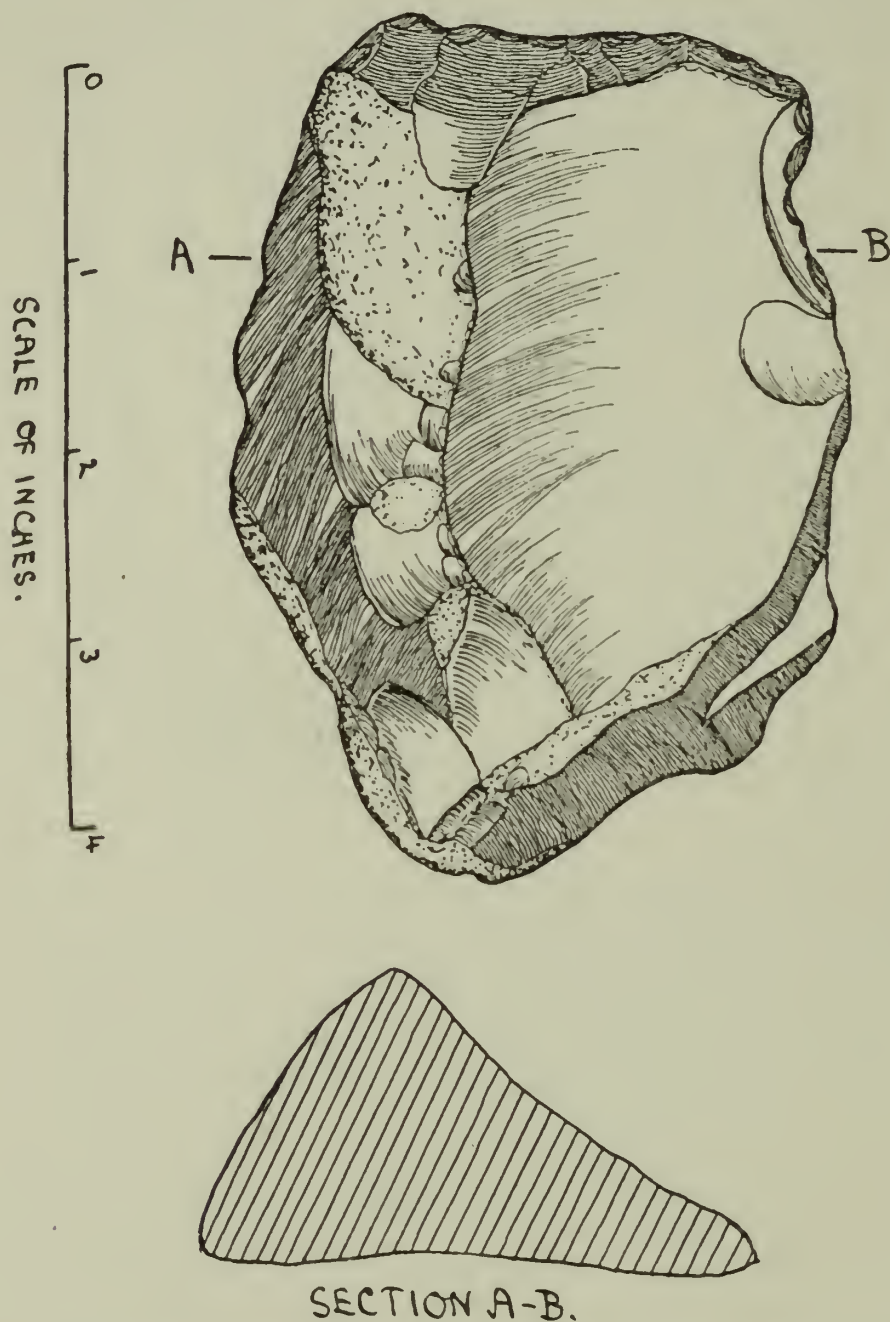


Fig. 17. Large scraper from the Cromer Forest Bed, East Runton. *R.A.I.*

in order to allow of a comfortable hand-grip, but the hands of these ancient people must have been much larger than ours, because even a large-handed man of to-day could not grasp such implements satisfactorily. We conclude, therefore, that the primitive Cromerians were of great strength and size of hand, but we cannot absolutely prove this because, up to the



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present, no human bones have been found in the Forest Bed. It is, however, of interest to recall that, some years ago, there was found at a depth of about 90 feet from the surface at Heidelberg in Germany a human lower jaw-bone of immense size, which must have belonged to a person of almost gorilla-like proportions.<sup>1</sup> This precious relic occurred in a deposit which is regarded by many as equivalent in age to the Cromer Forest Bed, and it is indeed significant that the Cromer implements should indicate that their makers were very strong and large-handed people, and that a human jaw-bone which might well have belonged to one of these individuals should come to light in Germany in a deposit of the same age as the Cromer Forest Bed. In fact, we

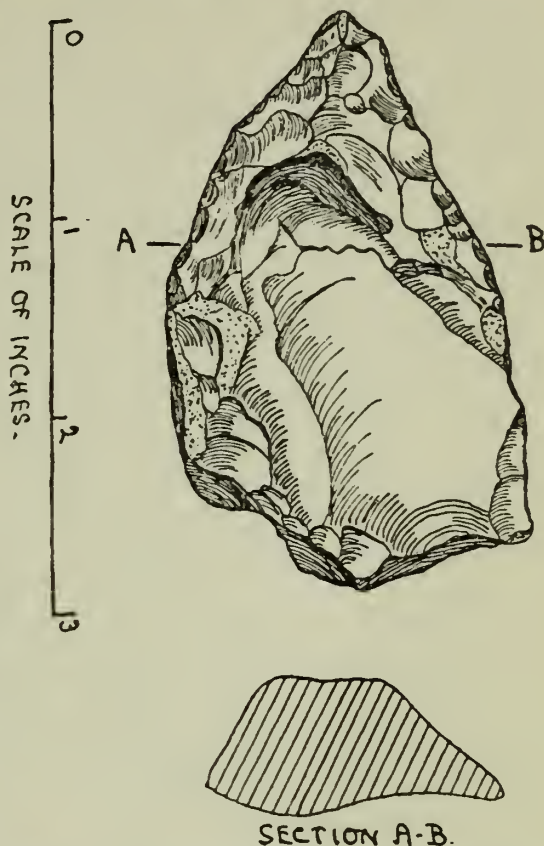


Fig. 18. Pointed implement from the Cromer Forest Bed, East Runton. R.A.I.

may regard it as highly probable that the man of Heidelberg was one of the race of people who made the great flint implements of Cromer. We do not know how long the Cromer Forest Bed period lasted, but it is certain that it closed with conditions of extreme cold, for the deposits we have been discussing are covered by an immense thickness of clay, and other material, laid down during one of the phases of the Ice Age.

The implements of the Cromer Forest Bed are, unquestionably, of early Palaeolithic types, and prior to the discovery of these specimens in this deposit, examples had been found only in beds of gravel situated in river valleys. These gravel implements show considerable signs of rolling by water action, and have evidently had a long history before their arrival in the deposits where they are now found. But the specimens from the Cromer Forest Bed do not, usually, exhibit these marked signs of transport, and the reason for this is that the Forest Bed is their original home, so to speak, and represents

<sup>1</sup> Schoetensack, O., *Der Unterkiefer des Homo Heidelbergensis aus dem Sanden von Mauer, bei Heidelberg*, Leipzig, 1908.



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the geological period in which the early Palaeolithic implements were actually made. The gravel examples, on the other hand, have been derived from the break-up of pre-existing deposits of Cromer Forest Bed age, and to judge of the geological antiquity of these specimens from the age of the gravel in which they now occur is erroneous. As has already been mentioned, the Cromer Forest Bed consists of three divisions, and the flint implements hitherto found are referable to the lowermost bed of the series. These specimens, as has been shown, are very massive, and represent the earliest Palaeolithic hand-axes, but the type of implements contained in the Middle and Upper divisions of the Forest Bed is not



Fig. 19. Flint implement of Early Palaeolithic-Chellean type from Lower Glacial Clay, Sidestrand, Norfolk. *A.J.*

yet definitely known. Future researches—which I hope to carry out—may fill this gap in our knowledge, but a discovery made recently by Mr J. E. Sainty has an important bearing on this question. The Cromer Forest Bed is overlain by the immense deposits laid down during the Second Glacial Period of East Anglia, and at the base of these deposits, *in situ* in a typical Glacial Boulder Clay exposed at the foot of the cliff at Sidestrand, Mr Sainty found a flint implement of early Palaeolithic type (Fig. 19). This specimen, which the finder has generously presented to the Ipswich Museum, I have described,<sup>1</sup> and there cannot be any doubt that it is of a much more advanced Chellean type than the implements found at

<sup>1</sup> Moir, J. Reid, *Antiquaries Journal*, vol. CXI, April 1923, No. 2, pp. 135-137.





PLATE VII



PIECE OF HUMANLY-SHAPED WOOD FROM  
CROMER FOREST BED, MUNDESLEY, NORFOLK  
(Nat. size.) *Man*



the base of the Cromer Forest Bed. The Sidestrand hand-axe is quite sharp and unabraded, and its colour is in every way comparable with many flints occurring in the Upper Fresh-water Bed—the uppermost division of the Forest Bed—exposed at West Runton, and as the glacial clay overlying this latter deposit very frequently contains portions of the Fresh-water Bed, which were torn up by the glacier in its advance, it becomes highly probable that the Sidestrand specimen belongs to this horizon and represents the type of implement made at the close of Forest Bed times. It is of interest to note that, many years ago, both Mr Lewis Abbott and Dr W. L. H. Duckworth found certain flints in the Cromer Forest Bed which they claimed were humanly flaked<sup>1</sup>—while the late Mr S. A. Notcutt of Ipswich dug out of this deposit, at the foot of the cliff near Mundesley, a piece of wood (Plate VII) which, in my opinion, was shaped by man.<sup>2</sup> The bed in which the wood was found consisted of undisturbed sand and gravel, and was overlain by Lower Glacial Clay *in situ*. The specimen, which is quite comparable with other wood found in the Forest Bed, is, as will be seen from the accompanying illustration (Plate VII), slightly curved, four-sided, and is flat at one end and pointed at the other. It measures  $6\frac{3}{8}$  inches in greatest length, and  $2\frac{1}{8}$  inches in greatest width. The flat end appears to have been produced by sawing with a sharp flint, and at one spot it seems that the line of cutting has been corrected, as is often necessary when starting to cut wood with a modern steel saw. The present form of the specimen is due to the original round piece of wood—which has been identified by Dr A. B. Rendle, F.R.S., as yew—having been split four times longitudinally in the direction of its natural grain. The pointed end is somewhat blackened as if by fire, and it is possible that the specimen represents a primitive digging stick used for grubbing up roots.

Another important discovery of a well-made Palaeolithic flint implement which was evidently derived from the same Boulder Clay as sheltered Mr Sainty's specimen described above, was made at Eccles on the Norfolk coast by Mr W. R. Spelman of Norwich. The implement, which is of Lower

<sup>1</sup> Abbott, W. J. L., *Natural Science*, x (1897), 89; Duckworth, W. L. H., *Camb. Antiq. Soc. Communications*, vol. xv.

<sup>2</sup> Moir, J. Reid, *Man*, vol. xvii, No. 2, November 1917.

## THE MEN OF THE CROMER FOREST BED

Palaeolithic age,<sup>1</sup> was picked up on the shore after there had been a heavy scour of the beach (Fig. 20), and as the flint shows no signs of abrasion or rolling by water-action, the conclusion is inevitable that it had been washed out of the Boulder Clay immediately underlying the beach at Eccles, just prior to Mr Spelman's arrival upon the scene. The specimen is now preserved in the Castle Museum at Norwich.

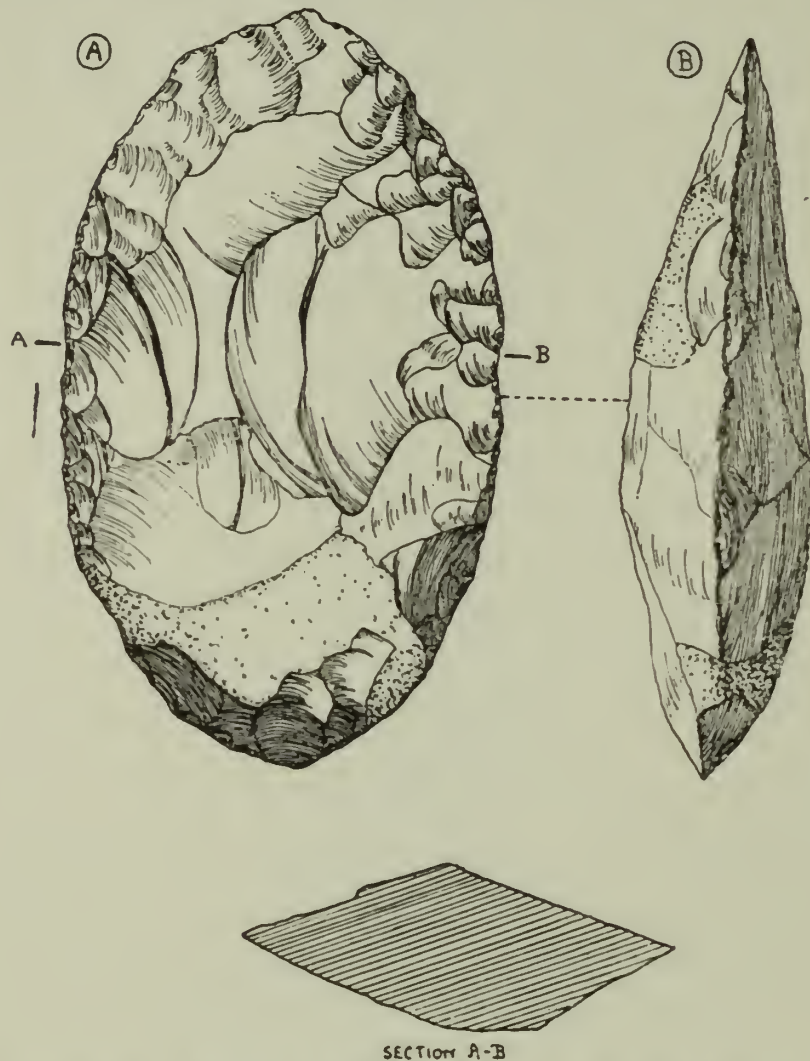


Fig. 20. Hand-axe, of Lower Palaeolithic age. Unrolled, found upon the beach at Eccles-on-Sea, Norfolk. (About  $\frac{1}{2}$  nat. size.) *Man*.

So long ago as in 1884, Sir John Evans, while walking along the East Runton foreshore at low water with Mr Savin, picked up an ochreous flint flake, which he presented to the latter gentleman with the remark that it was, apparently, of Palaeolithic age.<sup>2</sup>

An examination of this specimen makes it clear that it is of the same kind, both in technique and colour, as those found at the foreshore workshop site at Cromer—described above.

<sup>1</sup> Moir, J. Reid, *Man*, vol. XXVI, 1926, p. 42.

<sup>2</sup> Evans, Sir John, *Ancient Stone Implements of Great Britain* (2nd edition), p. 572.



## THE MEN OF THE CROMER FOREST BED

During this year (1926) Mr J. E. Sainty found upon the beach at Overstrand a piece of heavily mineralised bone which is

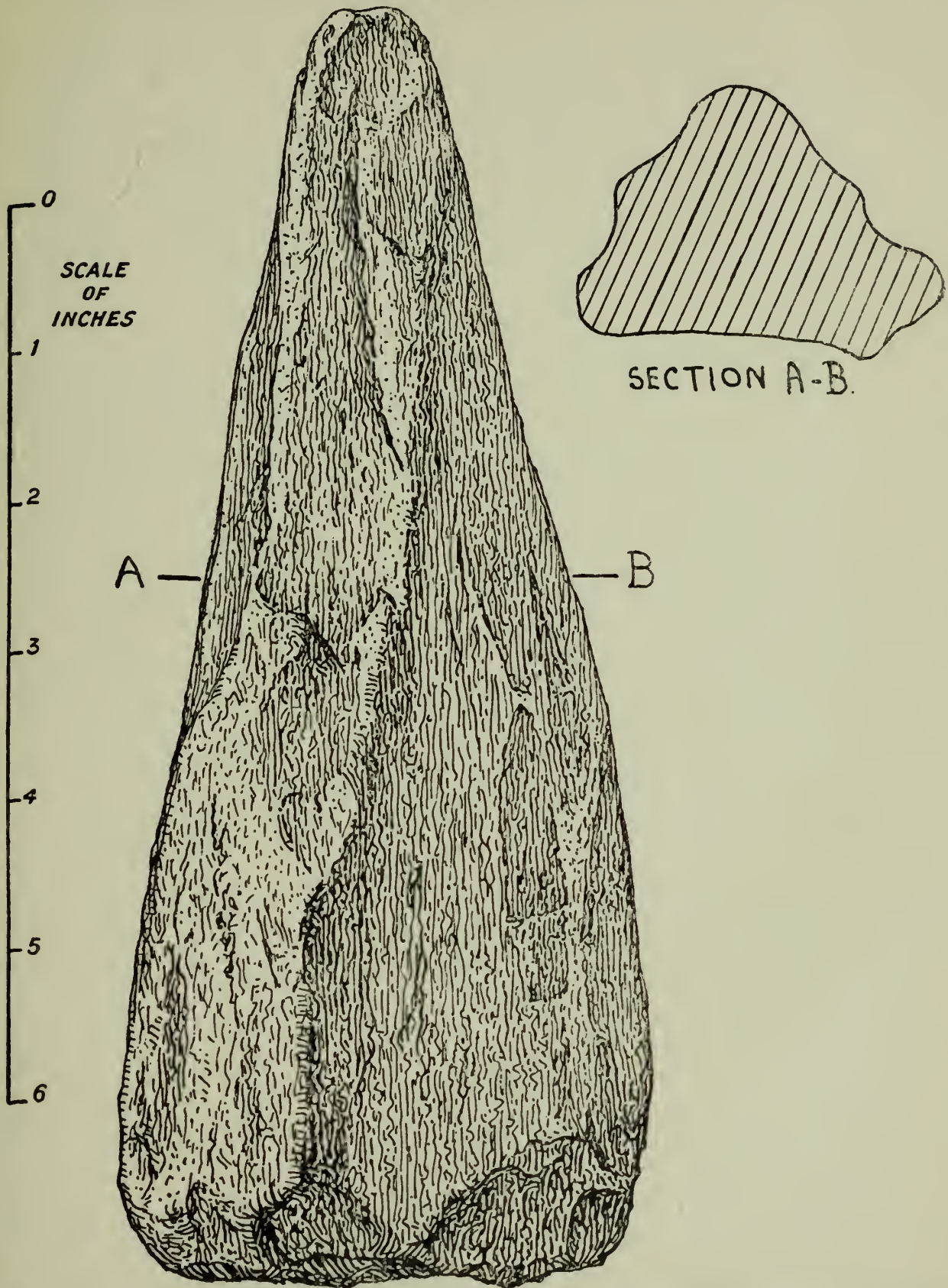


Fig. 21. Large and heavily mineralised bone implement, found by Mr Sainty on the foreshore at Overstrand, Norfolk, and derived from the Cromer Forest Bed.

evidently referable to the Cromer Forest Bed. This specimen (Fig. 21), for the excellent drawing of which I am indebted

to Mrs Gertrude Woods, is very heavily mineralised, of a drabbish-grey colour, and somewhat rolled by water-action. As will be seen from the illustration, the bone is of a markedly implemental form, in fact, on the surface figured and at the butt-end, it exhibits flaking and hacking, which, judging from the experiments I carried out in shaping this material, I think has been intentionally produced. The under surface shows cancellous tissue exposed when the base was originally split open, and in a fresh condition. Sir Arthur Keith, F.R.S., who examined the specimen, has kindly given me the following opinion upon it:

“There can be no doubt, I think, that your implement has been fashioned out of the lower jaw of one of the larger whale-bone whales. None of the original surface of the bone is left, it has been removed by flaking.” From the extreme fossilisation of this specimen I judge it to belong to the earliest Cromer Forest Bed deposit, and to be contemporary with the great flint implements found at that horizon. Remains of whales have been discovered in the Forest Bed and it was doubtless the skeleton of one of these that supplied the material from which this implement was made by one of the earliest Cromerian men.

The discovery of flint implements in the Forest Bed induced me to make a close examination of the mammalian bones from this deposit, in the possession of Mr A. C. Savin of Cromer. This examination revealed three specimens all found in the peat, representing the upper part of the Forest Bed at West Runton, by Mr Savin, which show on their surfaces clearly defined cuts which, I think, can only have been produced by flint knives in removing the flesh. Such markings are common upon many bones found in association with ancient flint implements, and the Cromer examples are quite comparable with others exhibiting cuts which I have discovered in various later prehistoric epochs. The lines are fine, and straight, and were evidently produced by a sharp-edged flint. Some of the smaller mammals might cut a bone with their teeth in a similar way, but they could not produce such long cuts as are present on the bones from West Runton. Nor is it possible to regard these markings as due to glacial action, as the form of the cuts is not such as are due to glaciation—while the bed



itself, in which the bones were found, containing as it does a large number of very fragile, though, in many cases, unbroken shells, has certainly not been disturbed by ice-action. The bones comprise part of the humerus of a large (?) bison, and portions of the lower jaws, with teeth in place, of deer. The antiquity of the cuts is testified to, by the fact that, in some cases, they pass under a very hard ferruginous deposit present upon the specimens, and the fact of their presence upon these bones is probably due to the fact that the fossils in the West Runton peat are excellently preserved so that the original outer layer of the specimens bearing the scratches, is intact. The great majority of the Cromer Forest Bed bones are, however, considerably abraded, and the signs of surface cutting upon these—if at one time present—has long since disappeared. I have recently carried out some experiments in scraping modern bones with a sharp flake of flint, and find that the cuts so produced are in every way comparable with those upon the Cromer examples. It was noticed that these latter specimens, in addition to the easily recognised cuts, exhibited a large number of minute incisions which could only be examined, adequately, by means of a lens. Upon the experimental bones I found that a precisely similar assemblage of small cuts was present, and I have no doubt that these are due to the microscopic projections present on the cutting-edge of the flint which I used.

Thus, there is now in existence a large and important body of evidence to show that East Anglia was inhabited by races of Early Palaeolithic men in the remote Forest Bed epoch, when a sub-tropical climate obtained in England in Chelleian times.

## CHAPTER VI

### *The Great Ice Age in East Anglia*

MOST people have heard something about that period in the earth's history known as the Great Ice Age, when immense ice sheets occupied large areas which now enjoy a temperate climate. There are many mysteries that geologists have to solve, but the cause of the extraordinary lowering of temperature, which gave rise to this widespread extension of the polar ice-caps, is one of the most difficult, and many are the suggestions that have been put forward to account for it. It is not possible for me to give here a detailed account of these suggestions, but it may be said that some have supposed that the eccentricity of the earth's path round the sun would, at stated and widely separated intervals, produce an Ice Age, while others have thought this condition might have been brought about by a great lessening of the sun's heat, or a marked elevation of certain portions of the earth's surface, which would bring in their train a whole series of drastic climatic changes. But whatever the cause of the Ice Age may have been, it is clear, from the presence in various geological periods of deposits laid down by ice, that this cause operated from a very early period of the earth's history, and that the last glacial epoch came to an end, from fifteen to twenty thousand years ago. It has generally been supposed that, in England, glacial conditions were confined to the Quaternary, or fourth geological period, and there is no doubt that, in East Anglia, there is abundant proof of the existence, in that epoch, of successive invasions and retreats of the ice. As I have already explained there is present in Suffolk, Essex, and Norfolk extensive deposits of the Tertiary, or third geological epoch, and the researches I have carried out have made it appear probable, to me, that in the latest of these beds, referable to the end of Tertiary times, evidence exists of the presence of ice in the East Anglian area.<sup>1</sup>

<sup>1</sup> Moir, J. Reid, *The Great Flint Implements of Cromer, Norfolk*, p. 15, Harrison, Ipswich.



The former presence of an ice-sheet in any given area can be recognised by several well-marked signs. In the first place there is the evidence afforded by what are known as "foreign erratics". To explain what these are in an easily understood manner, I would put it in this way. When we meet a negro, for example, in England, we know that he is not indigenous to this country, but that he has come to this country from abroad. In a similar manner, when we find, say in Suffolk, large pieces of rock that do not occur in a natural state in that county, we know that such specimens have been brought into the area by some means. And when we realise that these rocks occur in what is known as Boulder Clay, that is a deposit laid down by ice, we have little difficulty in deciding that these examples of rocks foreign to Suffolk have been transported there during glacial conditions. As an ice-sheet advances over a land surface it tears up a great deal of the deposits over which it is moving, pushes some of them in front of it, rides over others, and leaves behind it, when it finally retreats, a chaotic and widespread deposit of clay which contains numerous fragments of the rocks torn up during its advance. Thus, in the Boulder Clay of the Norfolk coast, we find specimens of a beautiful rock, known as rhomb porphyry, that exists in Scandinavia, but not in Britain, and we know, therefore, that the ice which laid down that Boulder Clay originated far away to the north-east of Norfolk and advanced across what is now the North Sea. The presence of a former glacier may be realised also by the violent contortion and twisting of deposits, which, when originally laid down, exhibited no signs of disturbance. Such disturbances can be seen in many pits, and in the sea-cliffs of Suffolk, and Norfolk, and are due, chiefly, to the presence of the moving ice, when it met any obstacles, such as hills, in its path. When I was describing the ancient people who lived before the Red Crag of Suffolk was laid down, I spoke of an extensive land surface of London Clay on which they lived, associated with a number of warmth-loving animals, and this evidence makes it clear that the temperature of those days was by no means glacial. We know, however, that as the land surface of London Clay was slowly submerged beneath the sea, the climate was getting progressively colder, as the shells in the Crag show an ever-increasing proportion of cold-

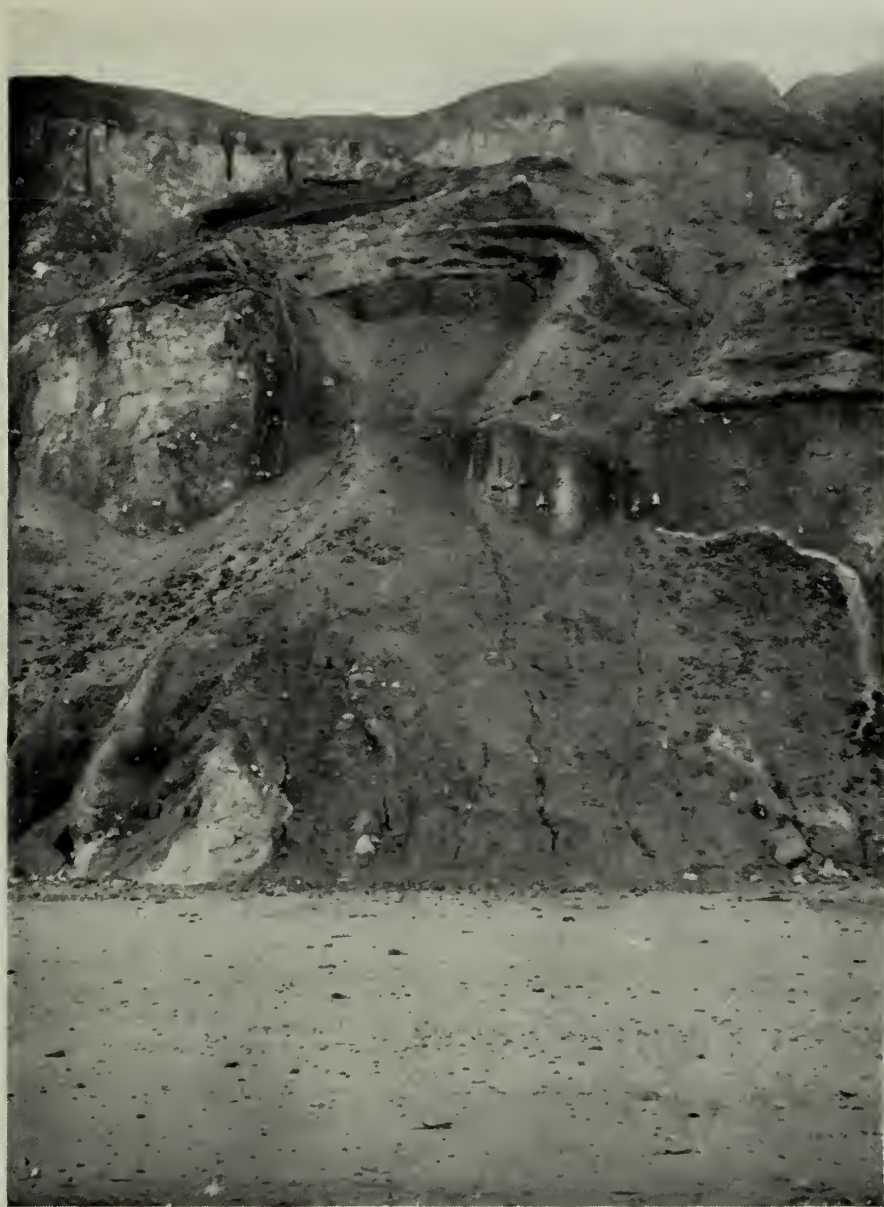
water species, until in the latest Crag deposits, nearly all of them are cold-water forms. This evidence of refrigeration is supported by the presence in the deposit, at the base of the Crag, of foreign rocks that must have been brought into Suffolk by floating ice. Many of these specimens, and the flints found with them, show clearly marked scratches on their surfaces, due to the presence of the moving ice of those days. These scratches occur on many stones in glacial deposits, and also upon the rocks over which the ice passed, and are well recognised as being due to this cause. When the Red Crag was upraised as a land surface we find, in the Cromer Forest Bed, which rests upon the Crag, the remains of a quantity of warmth-loving animals, such as the great southern elephant, hippopotamus, and sabre-toothed tiger, together with the flint implements of man, and we know from this evidence that genial climate conditions had once more made themselves manifest in East Anglia. We have no idea how long this warm period lasted, but the Cromer Forest Bed is covered up by huge glacial deposits laid down by the Scandinavian ice-sheet to which I have referred—and this shows that the climate had degenerated and glaciers were again present in East Anglia. To gain a real idea of what glacial deposits are like, it is necessary to go to places like the north-east coast of Norfolk, and examine the great cliffs of that district. At East Runton, near Cromer, there is to be seen, in the cliff, an astonishing amount of twisting and contortion of the deposits, and an immense mass of chalk, nearly a quarter of a mile long and averaging 25 feet in thickness, that was torn up and re-deposited by the ice, can be seen in the cliff face<sup>1</sup> (Plate VIII).

There is no doubt that this Scandinavian glacier was present for a great space of time off the coast of Norfolk, and the high and prominent Cromer ridge, upon the top of which the L.N.E.R. station stands, is said to represent the huge heap of material which the ice gathered in front of it.

But we know that, after this very cold epoch, the ice began to melt, and the torrential waters resulting from this melting, in their wild rush to sea-level, hollowed out deep channels in the underlying glacial clay. In some of these channels has been

<sup>1</sup> Moir, J. Reid, *Journ. Roy. Anthr. Inst.* vol. LV, Plate XXVIII, 1925, July to December.





GLACIAL  
DEPOSITS  
80 feet

← with Chalk  
erratic

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CROMER  
FOREST BED  
20 feet

-----  
BEACH

← LEVEL OF FLINT  
IMPLEMENTS

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BEACH

VIEW OF CLIFFS AT EAST RUNTON, NORFOLK  
showing glacial deposits and chalk erratic. *R.A.I.*





found a series of brickearths, and gravel, which contain the remains of animals and plants that can live only in a temperate climate, and with these remains have been discovered well-made flint implements made by Palaeolithic man.<sup>1</sup> Above these beds of brickearth and gravel, however, we find further glacial deposits, sometimes in the form of an actual Boulder Clay, which weathers to a yellow colour on exposure, and we thus see that, for the third time, the climate of Eastern England had become very cold. After the disappearance of the ice that laid down the last-mentioned Boulder Clay, the climate slowly changed and developed, after a partial relapse into cold conditions, finally, into those existing to-day. It is evident, therefore, that an examination of the deposits of the Ice Age in East Anglia shows that man, in the past, has always flourished in the warm episodes intervening between the various glacial periods. Not only do we realise this, but we see that his flint implements show a gradual improvement in form and workmanship in each successive inter-glacial period. This improvement indicates that man himself was also progressing, and his status in life becoming higher. A study of this matter also shows us that there is every reason to believe that the great changes in climate I have described, which were not, of course, confined merely to East Anglia, took place with the utmost slowness, and this fact enables us to form some idea of the immense gulf of time that separates us from the days when the earliest East Anglians lived their lives on the ancient London Clay land surface, now buried deep beneath the Red Crag.

The best known work upon the glaciations of northern Europe is that carried out by two German geologists, Messrs Penck and Brückner,<sup>2</sup> who have achieved remarkable results from their prolonged study of the glacial deposits exposed, chiefly, in the valleys tributary to the river Danube. These investigations have recognised four principal glaciations—which are named after the valley in which the evidence of each was best developed. There is little doubt that the cold epochs of northern Europe are represented in East Anglia, and it is

<sup>1</sup> Boswell, P. G. H. and Moir, J. Reid, *Journ. Roy. Anthr. Inst.* vol. LIII, 1923, January to June.

<sup>2</sup> Penck and Brückner, *Die Alpen im Eiszeitalter*.

## THE GREAT ICE AGE IN EAST ANGLIA

now possible to equate, tentatively, these epochs in Suffolk and Norfolk with those of the Danube Valley.<sup>1</sup>

Valley of the Danube	East Anglia
Günz	Red, Norwich and Weybourne Crag
Mindel	Lower glacial deposits of Cromer, and Kimmeridgian Boulder Clay of Suffolk
Riss	Upper Chalky Boulder Clay
Würm	Hill-washes cloaking sides of valleys in Suffolk

There are three places in East Anglia where there are known to exist camping grounds of the Palaeolithic people who lived in the inter-glacial, warm period, intervening between the Second and the Third Glacial epochs of this area.

The first is within the Borough of Ipswich at the site of the new works of Messrs E. R. and F. Turner, Ltd., Foxhall Road, where, for many years, a brickfield was present. The archaeological richness of this site was first discovered, several years ago, by Miss Nina Layard,<sup>2</sup> and since then two scientific examinations conducted by Mr Reginald Smith,<sup>3</sup> and by Professor Boswell and myself, respectively,<sup>4</sup> have been carried out which have resulted in the recovery of large numbers of very perfect, and unrolled, Palaeolithic flint implements from the deposits there exposed (Fig. 22). The town of Ipswich lies, chiefly, in the Gipping Valley, and is bordered on the east and the west, by the Suffolk plateau through which the Gipping has cut its way. The Foxhall Road site is situated on the high ground to the east, and is about 150 feet above sea-level. Running across the plateau at this spot is a well-marked hollow, two or three hundred yards in width, representing a partially filled in channel that, at one time, existed there. Reference has already been made to the channels, and hollows, which were cut out by the glacier ice in its advance, and by the waters set free when the frozen mass melted, and the hollow present at the Foxhall Road site is a typical example of one of these. The

<sup>1</sup> Moir, J. Reid, *Geological Magazine*, vol. LVII, No. 671, May 1920.

<sup>2</sup> Layard, N. F., *Journ. Roy. Anthr. Inst.* vol. XXXIII, 1903; vol. XXXIV, 1904; and vol. XXXVI, 1908.

<sup>3</sup> Smith, R. A., *Proc. Geol. Assoc.* vol. XXVII, 1916.

<sup>4</sup> Boswell, P. G. H. and Moir, J. Reid, *Journ. Roy. Anthr. Inst.* vol. LIII, 1923, January to June.



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channel is cut out of the older beds of Red Crag, and gravel, forming the plateau and, at its base, is a layer of very definite Boulder Clay, one of the direct products of land ice (Fig. 23). The excavations that have been carried out at Foxhall Road have clearly established the following succession of events.

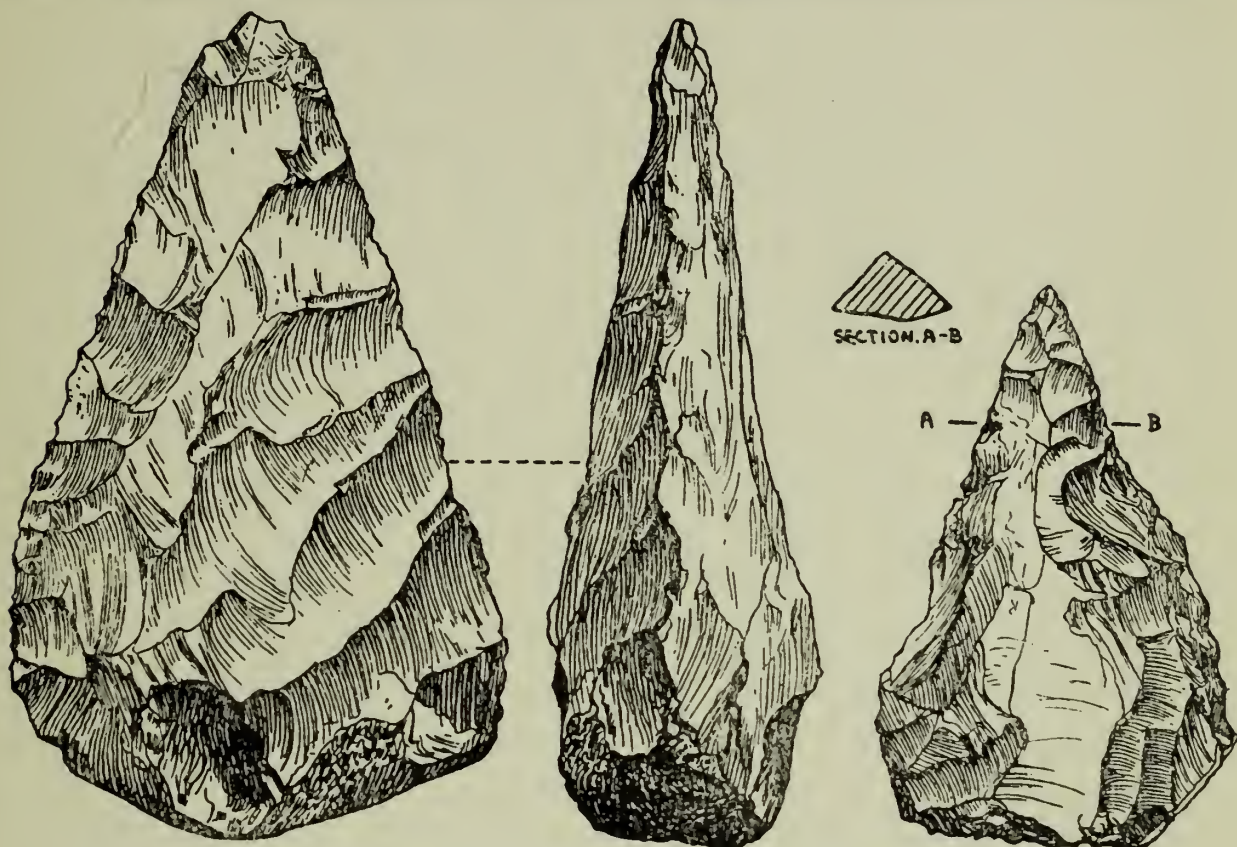


Fig. 22. Palaeolithic hand-axes from Foxhall Road, Ipswich.  $\times \frac{2}{3}$ . R.A.I.



Fig. 23. Diagrammatic section (not drawn to scale) of buried channel at Foxhall Road, Ipswich, showing Palaeolithic deposits resting on Lower Boulder Clay and covered by a glacial bed laid down during the third glaciation of East Anglia: (1) Ancient Gravel, (2) ? Red Crag, (3) Lower Boulder Clay, (4) Loamy Sand, (5) Brickearth Series containing Acheulean-Palaeolithic implements, (6) Upper Glacial deposit.

During the glaciation that overwhelmed the Cromer Forest Bed of Norfolk (the Second Glaciation of East Anglia), the ice of this epoch ploughed a long and wide hollow in the plateau to the east of Ipswich, and in it laid down Boulder Clay of a dark blue colour. When the retreat of the glacier began, the



water resulting from this process followed the course of the pre-existing channel and scoured out most of the Boulder Clay filling it. It is evident that, at this time, the outflow of this channel was, for some reason, blocked up, and it was thus transformed into a miniature lake. As the climate was then getting warmer, vast herds of animals were trekking into Suffolk, and such a sheet of water as existed at Foxhall Road would afford an excellent drinking place for these creatures, and soon be inhabited by fish and many kinds of wild fowl. Following this animal invasion, came parties of prehistoric hunters, and it is clear that some of these people established themselves upon the sides of the lake at the Foxhall Road site, because numerous examples of their weapons and implements have been found embedded in the silts and brickearths now filling the channel.

These Acheulean hunters (the name is derived from St Acheul—a place in France where the implements of this period were first found) were very expert in flint flaking, and their implements are wonderfully symmetrical, and well-made. The specimens at Foxhall Road are found at varying levels in the brickearth, and this fact shows that the people were living close to the water's edge, and that, as the lake rose, the ancient inhabitants had often to abandon their implements—which were quickly covered up by the deposits then being laid down. The flints are, in nearly every case, quite sharp and unabraded, and accompanied by hammer-stones, and very numerous flakes, thus showing that here was an actual encampment where the manufacture of flint implements was carried on. There would seem no doubt that the Foxhall Road site was occupied for a great length of time, but, finally, the climate again began to degenerate, and the thick deposits of brickearth are now sealed in by a bed laid down by the ice that advanced into Suffolk at the time of the Third Glacial period of this region. About 25 miles to the north-east of the Foxhall Road encampment there existed another of a very similar nature at Hoxne, close to the boundary between Norfolk and Suffolk. The village of Hoxne lies in the valley of the River Waveney, in a very beautiful part of northern Suffolk. It is here that the traditional site exists of the martyrdom of that world-famous Saint, St Edmund, who, it is believed, met his death in conflict with



the invading Danes in the year 870. Here, too, students of man's past know that there is present unique and classic evidence of human occupation at a time so ancient as to make even St Edmund appear modern. In the year 1797, when an epoch-making discovery was made at Hoxne, very little was known about the antiquity of man. In fact, the Neolithic implements used by people living at the close of the Stone Age were only then becoming recognised as evidence of the existence of human beings upon this earth at a time before the dawn of history. It is, therefore, all the more remarkable to find that there was living at, or near Hoxne, a man, John Frere, possessed of the prescience to realise that certain flaked flints discovered by him at some depth in a brickfield there in 1797, were not only undoubted works of man, but had been made by a race of ancient people "not of the present world", who were unacquainted with the use of metals.<sup>1</sup> The brickfield where, it is presumed, John Frere made his original discovery is still in existence, and lies on either side of the road leading from Hoxne to the county town of Eye. As at Foxhall Road, Ipswich, so here, we find a channel, cut out during the Second Inter-Glacial period of East Anglia—filled with deposits laid down in a lake, and containing splendid examples of the flint workmanship of late Acheulean man (Fig. 24). At the bottom of this channel Boulder Clay is present, and represents part of the same sheet that is found at Foxhall Road. The deposits filling the Hoxne channel, which many years ago were investigated by Mr Clement Reid on behalf of the British Association,<sup>2</sup> and are now being re-examined for the same Association by Professor Boswell and myself, are upwards of 50 feet in thickness, and comprise beds, that by their contents show that a temperate climate was present in those days. Towards the upper portion of these deposits the plant and other remains show that cold conditions were making themselves felt, and these culminated in the laying down of a glacial accumulation that—as at Foxhall Road, Ipswich—seals in the Palaeolithic beds (Fig. 25). The flint implements are found usually at about 8 to 12 feet from the present land surface, and lie in thin seams of sandy gravel in and below the brickearth.

<sup>1</sup> Frere, John, *Archaeologia*, 1800, vol. XIII, p. 206.

<sup>2</sup> *Report of British Association for 1896 (Liverpool)*, Section C.

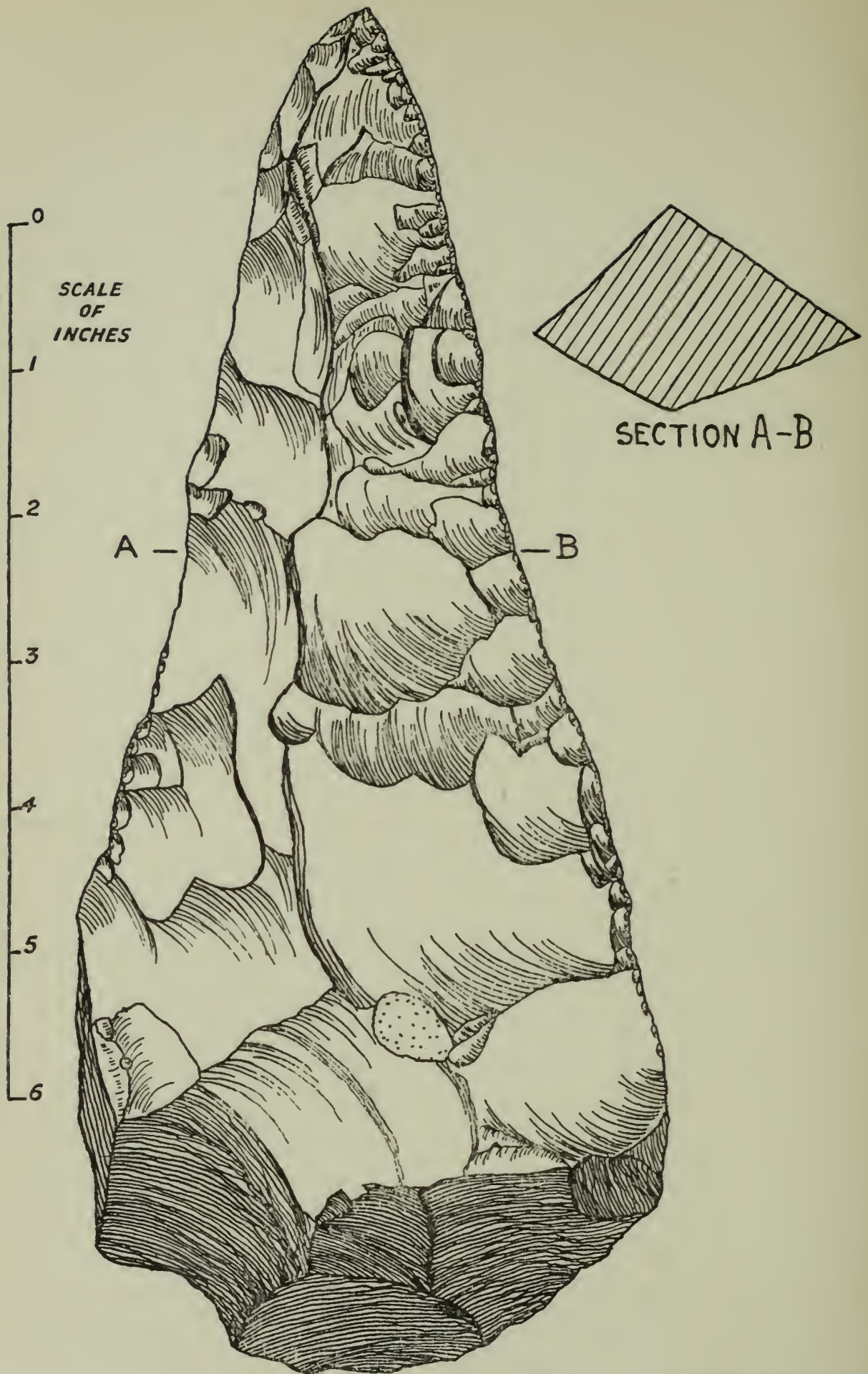


Fig. 24. Large Acheulean hand-axe with straight sides found in sandy seam below brickearth 10 feet from surface at Hoxne, Suffolk.



## THE GREAT ICE AGE IN EAST ANGLIA

These evidently represent ancient occupation levels of the period for there have been found a large number of superbly-made hand-axes, some with twisted cutting edges, together with

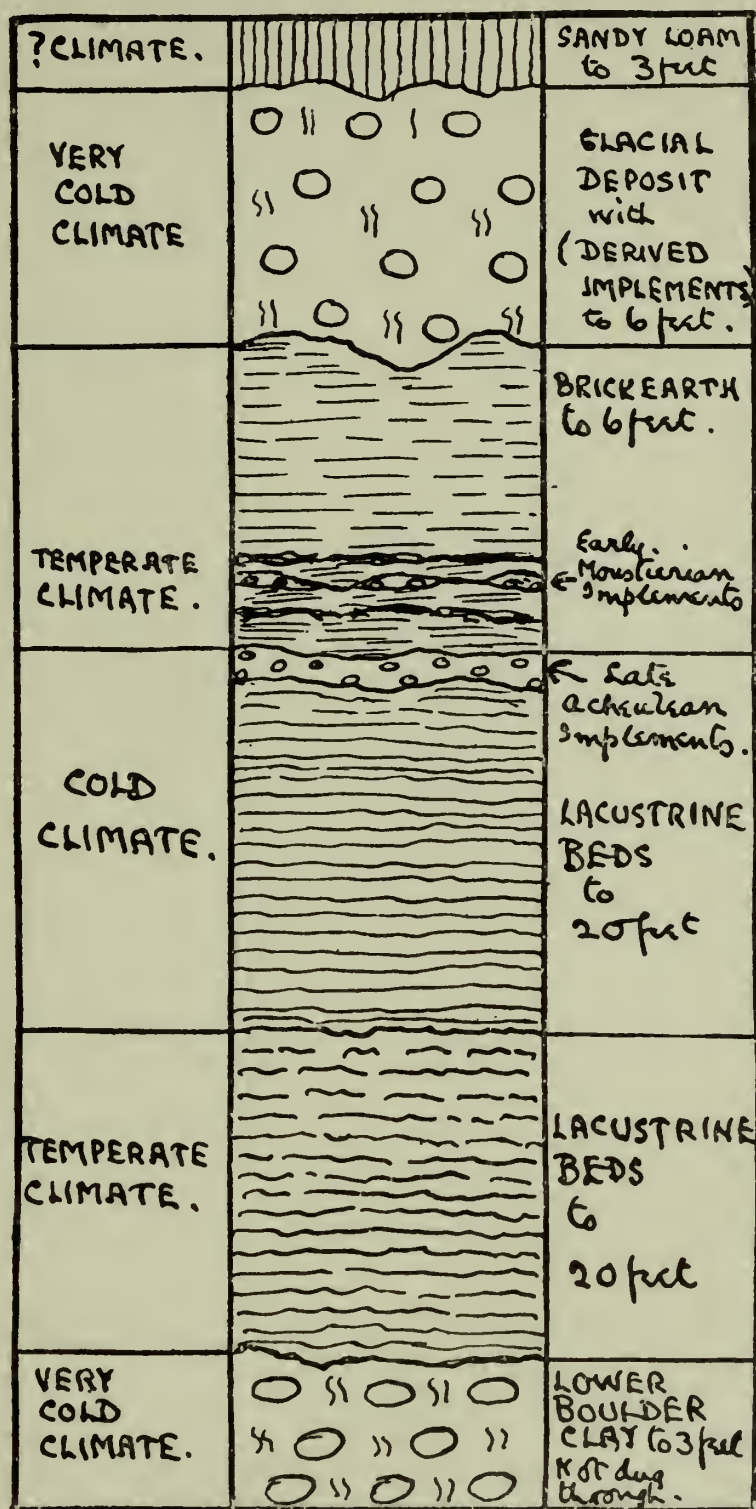


Fig. 25. Diagrammatic section of deposits at Hoxne, Suffolk, showing Palaeolithic beds resting on and covered by glacial accumulations.

quantities of flakes, and some hammer-stones. These specimens are unrolled, and have evidently remained untouched since Palaeolithic times—about 100,000 years ago. Associated with these Acheulean implements have been found, at a higher level

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in brickearth, examples referable to the succeeding prehistoric phase—known as the Mousterian—a name derived from the rockshelter of Le Moustier in the Dordogne, France, which is a type-station of the period. At both Foxhall Road and Hoxne there is clear evidence that great geological changes have taken place in the surface of the country since the Acheulean people lived, and this evidence of antiquity is even more conclusive in the case of the High Lodge site next to be considered.

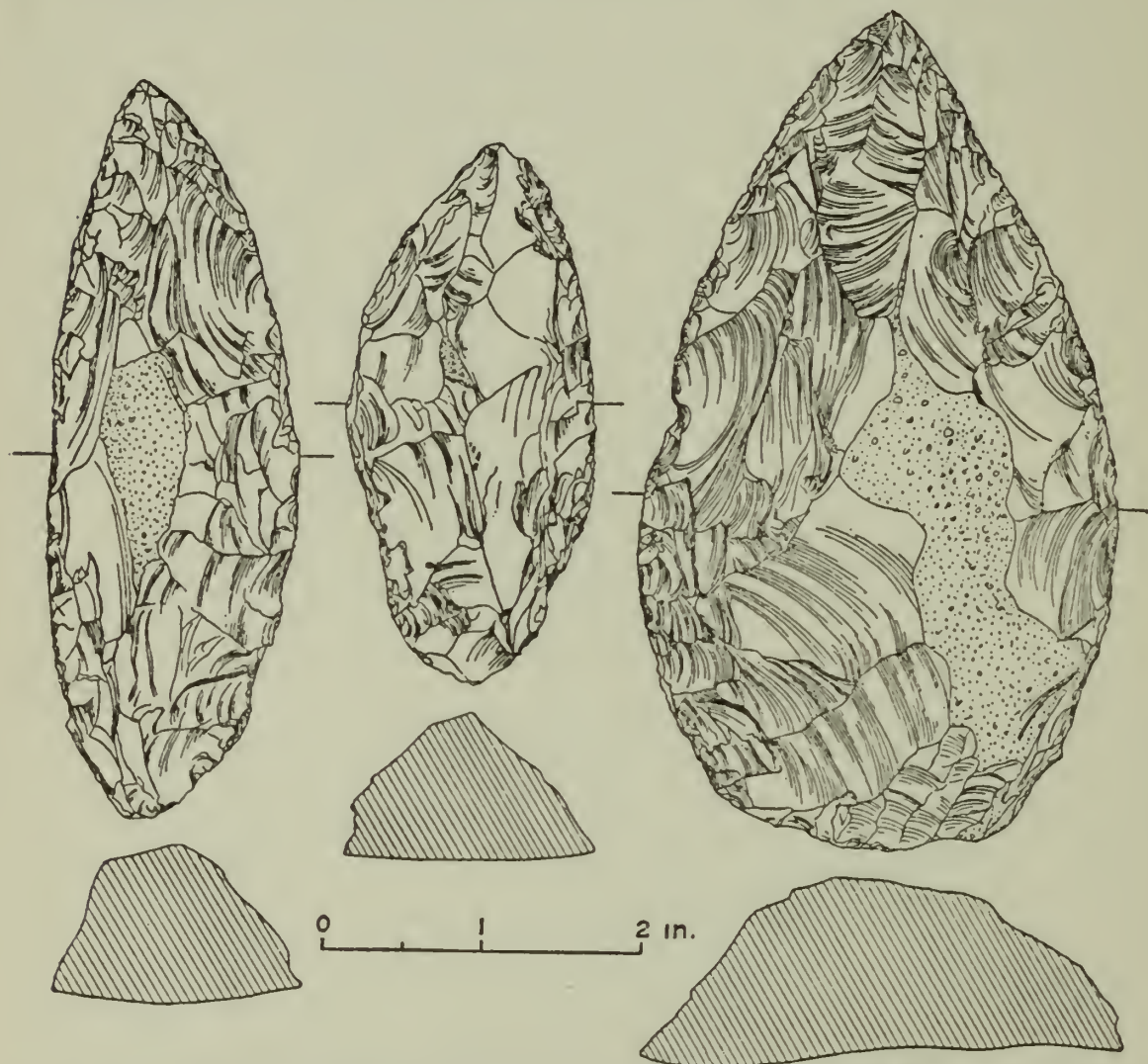


Fig. 26. Mousterian flint implements from brickearth at High Lodge, Suffolk.  
(After Reginald A. Smith.) *P.S.E.A.*

High Lodge lies about 30 miles due west of Hoxne, and about  $2\frac{1}{2}$  miles north-east of Mildenhall in north-west Suffolk. The brickearth containing the implements of Mousterian man occurs upon the side of a hill overlooking the great expanse of the Fens, and rests at about 100 to 120 feet above sea-level. The investigations, in which I took part, that have been carried out at this site in recent years,<sup>1</sup> have shown that here

<sup>1</sup> Marr, J. E., Smith, R. A. and Moir, J. Reid, *Proc. P.S.E.A.* vol. III, pt 3, pp. 353-379.



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again we have a channel cut out of the Boulder Clay of the Second Glacial period of East Anglia, and filled in with brickearth. In this hollow there lived for, no doubt, a prolonged period of time, Mousterian man, making his characteristic flint implements which differ in many ways from those of his predecessors, the Acheuleans. The former are made chiefly from flakes struck from a prepared nucleus of flint, and, unlike the Acheulean hand-axes, exhibit numerous flake-scars upon one surface only, the other showing merely the fracture-surface produced when the flake was detached from the parent core (Fig. 26). The implements of High Lodge are, however, very skilfully made, are quite sharp, and unabraded, and the brickearth in which they are embedded was evidently

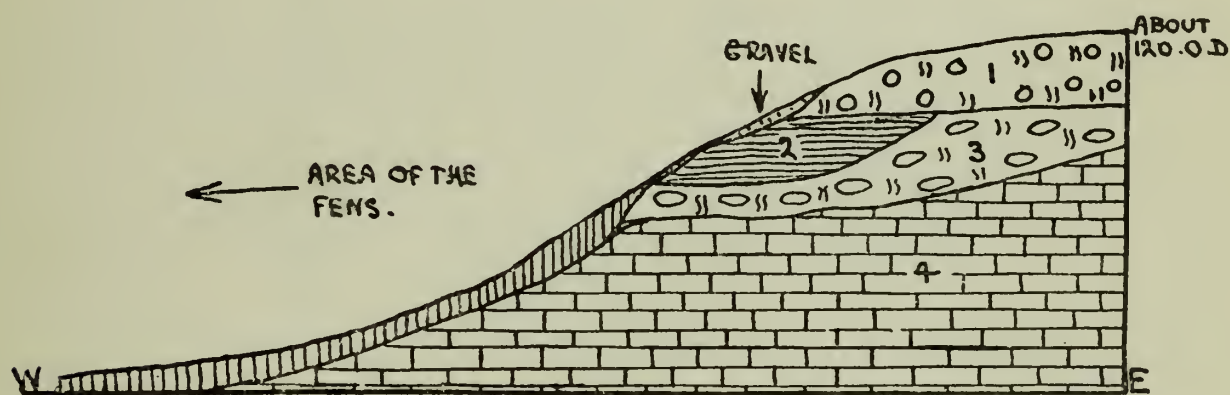


Fig. 27. Diagrammatic section (not drawn to scale) showing position of brickearth at High Lodge, Suffolk. (1) Upper Boulder Clay, (2) Brickearth with Mousterian implements, (3) Lower Boulder Clay, (4) Chalk.

overwhelmed by the same glacial deposit present above the implementiferous beds at Hoxne, and Foxhall Road. As has been stated the High Lodge brickearth lies in a hollow, but examination has shown that half of this hollow has now disappeared, owing to the vast geological changes that have taken place since it existed. In fact where the missing half of the hollow was present, is now the slope of the hill leading down to the Fens, and it becomes clear that the whole of the Fenland area—1306 square miles in extent, has been formed since Mousterian man lived at High Lodge (Fig. 27). There can be little doubt that this enormous removal of material was effected by the glaciers responsible for the deposition of the Boulder Clay overlying the brickearth as we know of no other agent of erosion which operated in this area, in post-glacial times, capable of carrying out a work of this magnitude.

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The flint implements of inter-glacial man are not, however, invariably found in brickearth, as a number have been discovered in sands and gravels which were laid down, under differing conditions, during the same temperate period. Thus, I have found many specimens (Fig. 28) made in inter-glacial times in the gravel beneath Boulder Clay in the brickfield of Messrs A. Bolton and Co., Ltd., Henley Road, Ipswich.<sup>1</sup> While vast numbers have been recovered from the famous gravel pit at Warren Hill, near Mildenhall, Suffolk,<sup>2</sup> a deposit that, in my judgment, must be regarded as of inter-glacial, or, as it has been called, "middle" glacial age. The Warren Hill

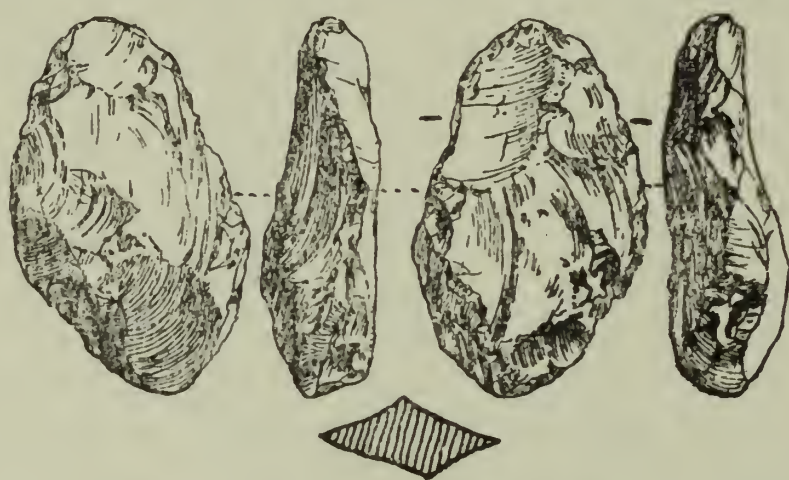


Fig. 28. Small hand-axe of Lower Palaeolithic age from Glacial Gravel in Messrs Bolton and Co.'s brickfield, Ipswich. ( $\times \frac{2}{3}$ ). R.A.I.

gravel rests upon a glacial clay that is, probably, of the same age as the Boulder Clay of the Second Glacial period of East Anglia, while above the gravel have been found traces of brickearth, apparently the base of the deposit exposed at High Lodge about a mile to the north, that was overwhelmed by the ice of the Third Glacial epoch. At one time the brickearth covered the Warren Hill deposit, but it has since been almost completely removed by denudation. Further, Mr A. C. Savin of Cromer found in 1878 in a layer of sand in glacial gravel, at West Runton, Norfolk, a very definite Palaeolithic flint implement (Fig. 29), of possibly late Acheulean type,<sup>3</sup> and Mr Guy Maynard, Curator of Ipswich Museum, found in 1922 in this same deposit at West Runton, an ovate specimen

<sup>1</sup> Moir, J. Reid, *Journ. Roy. Anthr. Inst.* vol. XLIX, 1919, pp. 74-93.

<sup>2</sup> Sturge, W. A., *Proc. P.S.E.A.* vol. I, pt 1, pp. 60-69.

<sup>3</sup> Moir, J. Reid, *Man*, vol. XXII, No. 24, 1922.



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referable to the end of Acheulean times, while, at several places along the north-east coast of Cromer I have discovered many examples of humanly flaked flints from the glacial gravel there exposed.<sup>1</sup>

Mention must also be made of the small series of Acheulean implements found by Mr J. Cox at Gresham, a place some miles to the west of Cromer.<sup>2</sup> One of these specimens was found in a vein of clay, about 6 feet below the surface, while sinking a well at the School House Gresham, another in sand

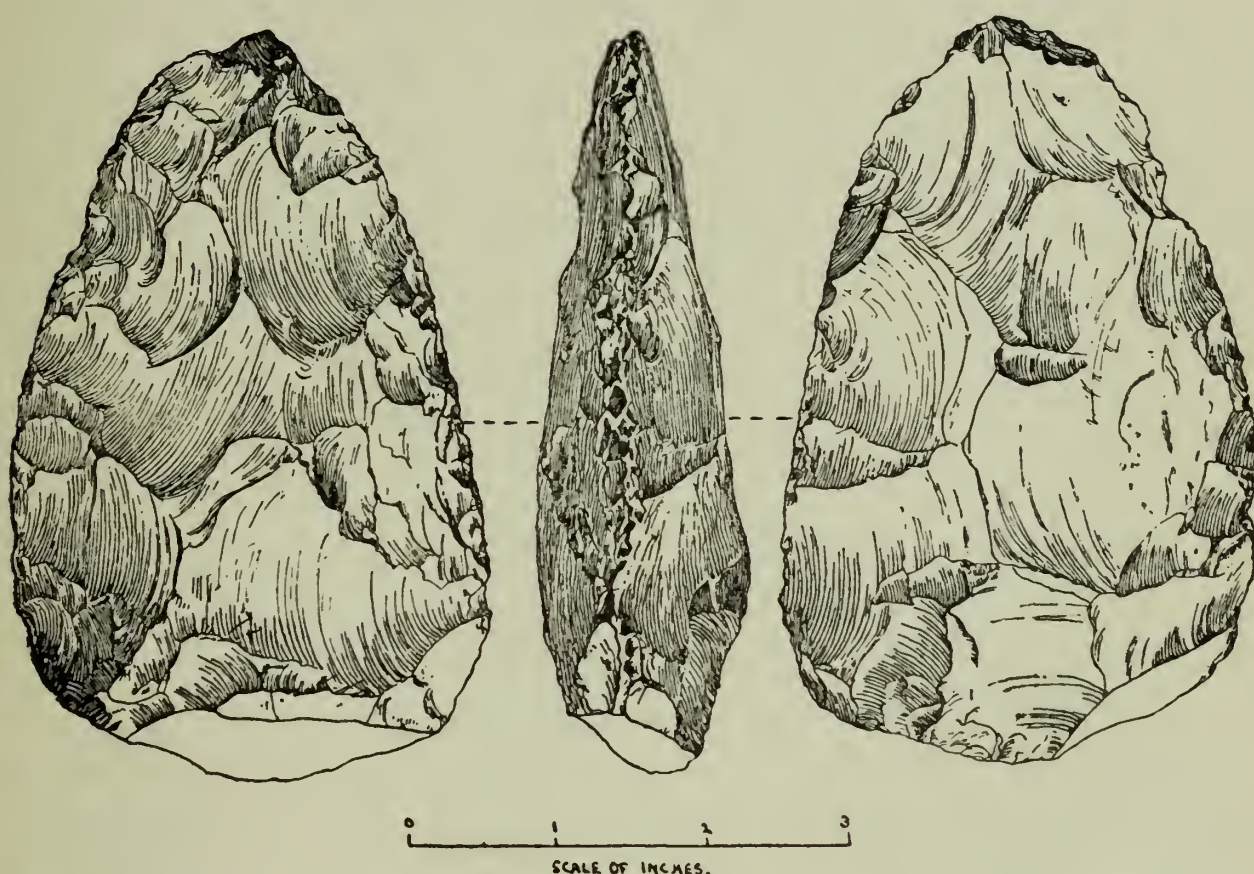


Fig. 29. Palaeolithic hand-axe of Acheulean age found in Glacial Gravel at West Runton, Norfolk. *Man*.

above marl at Mill Hill at the same place, while a third, which exhibits typical basket-work patination was discovered at a depth of two feet in gravel lying beneath a hollow filled in with clay. Gresham lies within an intensely glaciated region, and there is every probability that these specimens were derived from deposits similar in age to the inter-glacial beds at Hoxne, and Foxhall Road, Ipswich.

Another important discovery was made by Mr Cox of a

<sup>1</sup> Moir, J. Reid, *Proc. P.S.E.A.* vol. III, pt 11, pp. 219-243.

<sup>2</sup> Cox, J., *Proc. P.S.E.A.* vol. I, pt 3, p. 381 and vol. III, pt 3, Fig. 78.



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cream-coloured hand-axe, *in situ* in Glacial Clay. This deposit rests at a height of about 300 feet above sea-level (Fig. 30).

Sir John Evans also records the discovery by Mr F. C. J. Spurrell, in 1882,<sup>1</sup> of an ochreous Palaeolith from the gravel capping the hill near Gallows, or Gibbet Corner in Aylmerton parish, near Sheringham, Norfolk. I have endeavoured to find the present whereabouts of this specimen but without success. I am, however, familiar with the deposit of gravel mentioned, and have no doubt as to its being of glacial origin. Thus, evidence of the existence of inter-glacial man in East Anglia is clearly demonstrated at Foxhall Road, Ipswich, Hoxne, High Lodge, and at other places, and it is reasonable to suppose that Acheulean, and Early Mousterian, man lived in England in the warm period occurring between the Second and Third Glacial epochs. This conclusion is supported, further, by the discovery in the Boulder Clay overlying the



Fig. 30. Twisted hand-axe of Late Acheulean age found in Glacial Clay at Gresham, Norfolk. ( $\times \frac{3}{8}$ .) P.S.E.A.

<sup>1</sup> Evans, Sir John, *Ancient Stone Implements of Great Britain* (2nd edition), p. 572.



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Acheulean and Early Mousterian implements of specimens (Fig. 31) of these periods which were evidently torn out of the deposits in which they were embedded by the glacier during its advance.<sup>1</sup> At the time when the Third Glacial epoch was beginning there were living in the bottom of the Gipping Valley people of the Mousterian race. This is proved by a number of discoveries, made when carrying out excavations for a new coal-hoisting plant at the Electric Power Station, Constantine Road, Ipswich. I was able to investigate this discovery and found that the implements, associated with

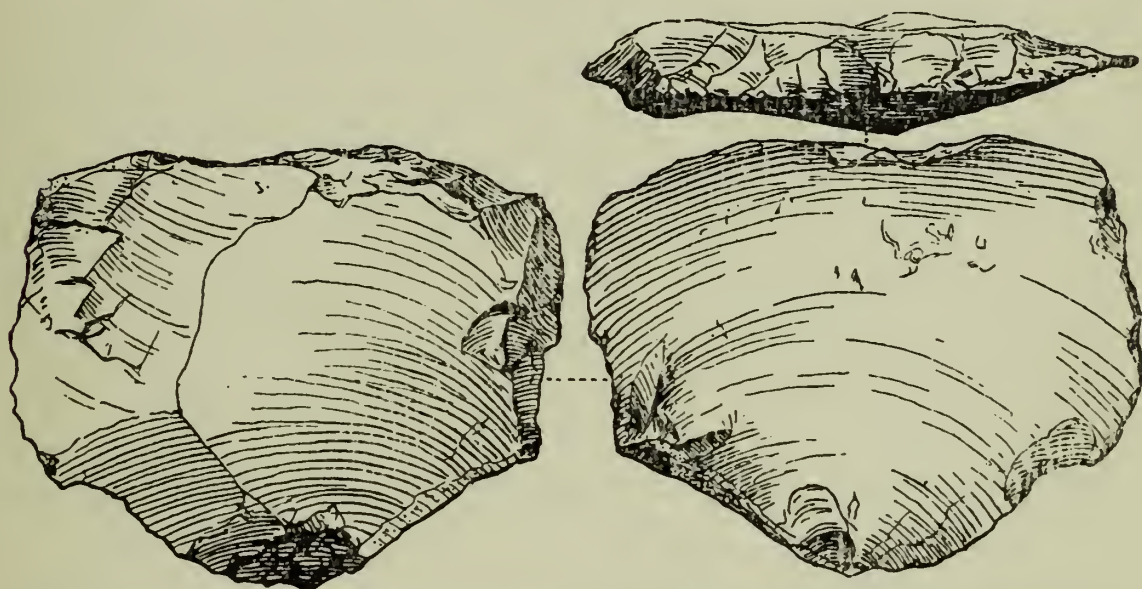


Fig. 31. Early Mousterian side-scraper from Upper Chalky Boulder Clay in Messrs Bolton and Co.'s brickfield, Ipswich. ( $\times \frac{2}{3}$ ). R.A.I.

numerous bones of reindeer, occurred under 8 feet of gravel and 10 feet of alluvium.<sup>2</sup> The Acheulean and Mousterian hunters lived for, probably, a very prolonged period upon the products of the chase in Suffolk and Norfolk, and they were associated with many animals differing markedly from those found in the earlier inter-glacial phase represented by the Cromer Forest Bed, while between the Chellean culture of this latter deposit and the Acheulean and the Mousterian phase of the Suffolk brickearths, there occurred the Second Glacial period, perhaps the most prolonged of any of that enormously extended episode in the earth's history. The mammalian life of Acheulean and Mousterian times was composed, chiefly, of the following animals:

<sup>1</sup> Moir, J. Reid, *Journ. Roy. Anthr. Inst.* vol. IV, 1920, January to June, pp. 135-152.

<sup>2</sup> Moir, J. Reid, *Man*, vol. XVIII, No. 7, July 1918.

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### Warmth-loving creatures

Straight-tusked elephant  
Hippopotamus  
Broad-nosed rhinoceros  
Spotted hyaena  
Lion  
Bison and wild ox  
Red deer  
Roe deer  
Giant deer  
Brown deer  
Wolf  
Horse.

### Cold-loving creatures

Woolly mammoth  
Woolly rhinoceros  
Reindeer  
Arctic fox  
Cave lion  
Cave hyaena  
Cave bear  
Stag  
Wolf  
Bison  
Wild cattle  
Horse.

A recent discovery by Mr H. H. Halls and Mr J. E. Sainty, of large numbers of Acheulean implements in a gravel at Whitlingham, near Norwich, provides us with another "station" of the people of this period in East Anglia. The implementiferous deposit, which I have examined, appears to me to be of glacial origin and is extraordinarily rich in well-made hand-axes. The specimens are unrolled and some are of great size and beauty of workmanship. I have little doubt that the Whitlingham station at which no mammalian bones have yet been found, may be correlated with that of Hoxne about 25 miles to the south.

Mr A. C. Savin of Cromer has in his possession a Palaeolithic flint implement of late Acheulean type found upon the surface of a field at Sidestrand, Norfolk. This specimen, which was discovered by the late Mr W. G. Sandford of Cromer, was, without much question, derived from the glacial gravel capping the cliff at Sidestrand.



## CHAPTER VII

### *The Colours of Flint Implements and the Fossilisation of Bone*

NODULES of flint when taken fresh from the chalk, exhibit a white and rather rough exterior which is known as the cortex. If, however, the specimen be broken, so that the interior of the stone is exposed, it will be seen that this differs markedly from the outside skin, or cortex, and exhibits a hard, homogeneous surface, of a black, or a grey colour. When prehistoric man made a flint implement the specimen was quite sharp, and black or grey in colour according to the kind of flint he used, but, in the course of the great period of time that has passed since these implements were made, they have assumed quite different shades, such as mahogany-brown, yellow, blue, or white, as the case may be. This colour change, which is known by the somewhat unsatisfactory term "patination",<sup>1</sup> does not penetrate far into the body of the flint, though in some cases the specimen has become slightly altered in colour throughout its mass. The patination of flint is a somewhat complex subject, but it has nevertheless, an important bearing upon the question of the age of flint implements, and, in consequence, upon the antiquity of man, and it is necessary, therefore, to deal with it briefly here.

If a large series of flint implements containing examples of every prehistoric culture found in England be examined, it will be seen that, speaking generally, the specimens can be divided up into three distinct groups by the differing colours exhibited by their flaked surfaces.

These groups are (*A*) implements that range in shade from a dark mahogany-brown, to a light chestnut-brown, (*B*) specimens that show either a streaky coloration of black and white (the well-known "basket-work patination")—or a dense blue, or white, and (*C*) implements that exhibit the unchanged colour of the original flint.

Such an examination will show, also, that this grouping of the specimens according to their colour, has grouped them,

<sup>1</sup> Moir, J. Reid, *Science Progress*, No. 78, October 1925, pp. 249-255.

moreover, according to their types, and that those showing coloration *A* are of Eolithic, pre-Chellean, Chellean, and Early Acheulean forms: those exhibiting coloration *B* are of late Acheulean, Mousterian, and Upper Palaeolithic types, while those showing coloration *C* are referable to the Neolithic period. In any large series of flint implements there will be exceptions to the above classification. Thus, in the early cultures grouped under *A* there may appear a few specimens that either do not exhibit any colour change upon their flaked surfaces, or show a blue or a white patination—or, in the cultures grouped under *B*, some specimens may show a chestnut-brown colour, or no colour change at all, and in group *C* there may appear implements showing a white, or a blue patination. But, though this is the case, there cannot be any doubt that the bigger majority of the oldest types of specimens are grouped under *A*, the less ancient under *B*, and the latest under *C*. When, however, the examination is carried further, we realise that in group *A* the oldest of the implements, the Eoliths, and the pre-Chellean specimens, exhibit the darkest shade of brown, the Early Chellean, a less dark tone of this colour, while the later Chellean and Acheulean implements are of a much lighter, chestnut-brown shade. Thus, it becomes clear, in regard to the specimens of group *A* that a certain type of patination is indicative of antiquity—and that the conditions giving rise to a brown coloration upon the flints operated with progressively less intensity during the great period of time represented by the cultures in this group. Though our present knowledge of the remarkable changes of colour that take place upon the flaked surfaces of flint is very small and inadequate, yet one or two facts, ascertained by experiment, have enabled us to form some idea how a few of these changes may have been brought about. It is known that the interior of a freshly broken sound flint of good quality is very hard, and the attempts to colour such a surface by placing the specimens in various staining agents—and without having resort to heat in the experiment, were unavailing.

When, however, the flint was subjected to the fumes of hydrofluoric acid for a few moments, it was noticed that the specimen first became blue, and as the process was continued, a dense white. When this stage was reached the flint was

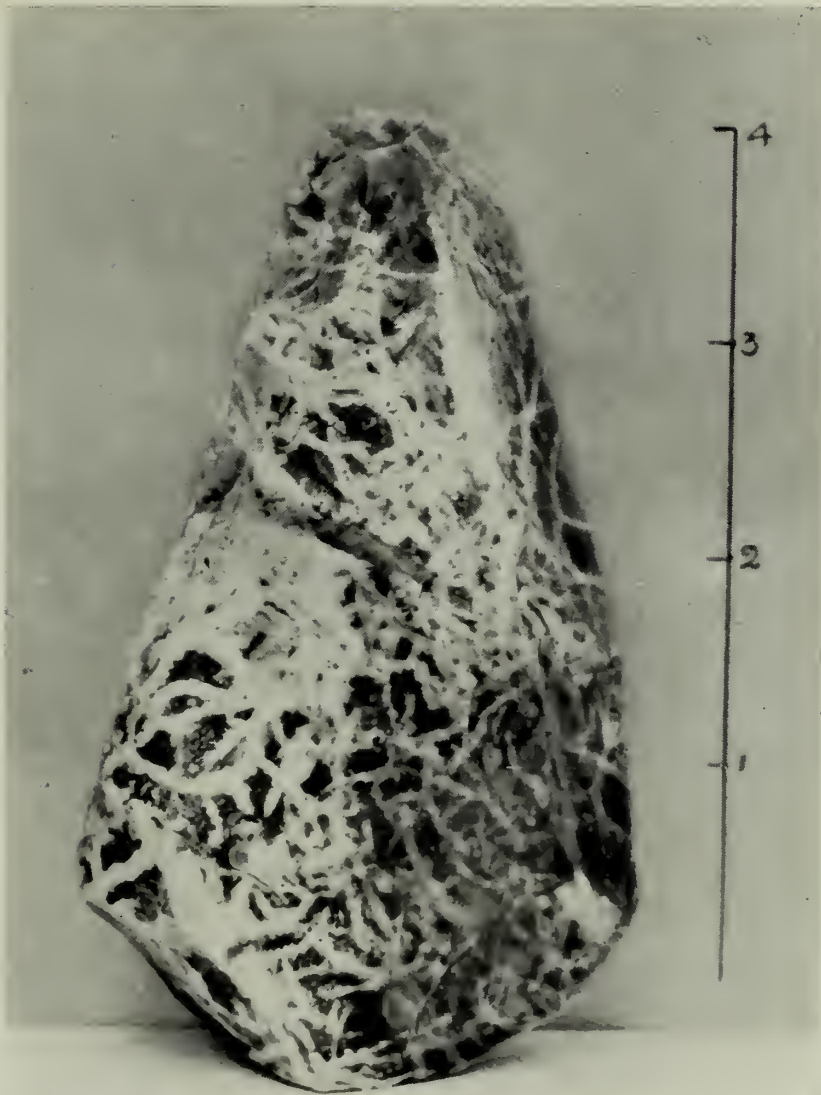


again immersed in a stain, and after a time became definitely and permanently coloured. Thus it is obvious, that the effect of the fumes of hydrofluoric acid produces a change in the surfaces of the specimen and enables them to absorb a stain. Judging from this evidence it seems reasonable to suppose that the flint implements that exhibit a dark-mahogany, or other shade of brown, have gone through a similar though much less rapid process to that described above, that is to say, they were first subjected to some solvent which made their surfaces white and absorbent, and that they were afterwards immersed in a material which permanently stained these surfaces. Now, upon the surface of the ground, in many parts of the country are to be seen large numbers of humanly flaked flints that are coloured either blue or white. If one of these specimens is broken, it is seen that the interior of the flint has suffered no colour change, and that the patinated surface is visible as a thin layer surrounding the fractured surface. Further, an examination of these blue and white flints will show that the former colour is due to the fact that the patinating process has not progressed very far and that the blue appearance is due to a thin film of white spread over the original black surface. When the process of patination has progressed so that the black of the original surface is no longer visible, then the specimen appears as a dense white. So far as we know this change occurs only upon (*a*) flints exposed upon a land surface, or (*b*) buried in certain pervious soils, just beneath such a surface, and so it is supposed that the ancient flint implements of group *A* were—as is in every way likely—exposed for a prolonged period upon, or in, a land surface, and there acquired a white patination. Eventually, they were buried beneath deposits which, it seems, must have been very rich in salts of iron, and that their long sojourn in these ferruginous beds had the effect of staining them. But, as the oldest flints in group *A* are the most stained, and as the stain gets progressively less in the later members of the group, we conclude that either the bed that sheltered the Eoliths and pre-Chellean specimens was richer in iron salts than that which sheltered the Early Chellean, while those which sheltered the later Chellean and Acheulean implements were still less ferruginous, or that these latter specimens were not exposed sufficiently long to atmospheric

conditions upon a land surface to have produced, upon their flaked surfaces, the white absorbent patination, such as is known, readily takes a stain.

When we pass to group *B*, containing specimens of Late Acheulean, Mousterian and Upper Palaeolithic types which exhibit either a streaky coloration of black and white—or a dense blue or white—we see that, as in group *A*, these patinations are, generally speaking, more marked upon the earlier members of the group, and that in consequence, patination in this group is again indicative of antiquity. The streaky “basket-work” coloration is remarkable both as regards its mode of occurrence upon flint implements—and its origin. So far as my knowledge extends this particular patination is not found upon any specimens earlier in date than Late Acheulean, and one must conclude that the conditions giving rise to it had not appeared until that period. Many Late Acheulean implements, however, exhibit basket-work patination in a well-marked form, but it is in the succeeding Early Mousterian phase that it is most definite and noticeable, while in the succeeding culture stages it becomes less and less apparent. The exact cause of this peculiar coloration (Plate IX) which takes the form of white streaks—which meander over the otherwise unchanged surface of the original flint is not at present known, but it would appear probable that it may have been given rise to by various causes. I have been able to examine a great number of flints from the Upper Chalky Boulder Clay of Suffolk, and other deposits, which exhibit this coloration, and this examination has shown me that the white streaks certainly differ in their origin. The great majority appear as white wavy lines in the surface of the flint, and exhibit no other peculiarities, and the origin of such lines is very obscure. They may represent areas in the flint surface which for some unknown reason are less hard than that surrounding them, and have thus become affected by the agent of patination which has failed to affect the harder portions of that surface, or they may be, as it were “roots” of the cortex of the flint exposed when the specimen was flaked, or they may have had their origin in the dissolving action of vegetable roots. Personally, I favour this last suggestion, because I have sometimes found pieces of fossil bone associated with the





PALAEOLITHIC HAND-AXE  
showing typical basket-work patination found in Glacial Clay,  
at Gresham, Norfolk. *P.S.E.A.*





“basket-work” flints, and these bones exhibit, on their surfaces, a series of wavy lines which are etched out, and appear almost certainly to be due to root action. In the case of the flints—as would be expected—the white lines are not etched out, but this is owing, in all probability, to the greater hardness of the flint surfaces as compared with those of the bones. A certain number of these white lines have, however, developed where the flint surface has been scratched, for, under a lens, the path of the agent of striation can be clearly traced by observing the “centipede marks” (these resemble in appearance the legs of a centipede) produced upon a flint surface by the pressure of a point moving across it under pressure. Such lines are, usually, more or less straight—and thus differ from those which follow a meandering course. In the experimental work which I carried out it was found, that when a piece of freshly-broken flint was struck with another stone—and incipient cones of percussion (the apices of cones of percussion formed in the flint by the blows) produced upon it—or when any bruising of the surface of the specimen occurred, these bruised areas were very susceptible to the artificial patinating agents used in the experiments. In fact it became clear that these agents “picked out” such areas and whitened them, while the other unbruised portions of the flint were not affected. The same order of events evidently obtained in the past when the implements were striated and then subjected to some agent of patination. When a flint exhibits merely these straight white lines, due to striation, it cannot be said to show a true “basket-work” patination, but, in some cases, the lines on one and the same specimen may be of both kinds. A further suggestion regarding the origin of these white lines is that they may be due to fossiliferous inclusions in the flint, which would give rise to soft areas susceptible to patination—but I do not regard this as at all probable. If one of the specimens exhibiting basket-work coloration be broken across it is seen that the whitened areas are of exceeding thinness and do not penetrate far into the flint.

The late Mr E. T. Lingwood found that when flints patinated white were immersed in oil for some time—the patination disappeared (this being due to the penetration of the oil into the flint)—but, that after the specimens had been

taken out of the oil, and exposed to the air for some time, the white coloration in most cases returned. But, with some of the flints he experimented with the surfaces did not return to their former condition, but showed a streaky coloration. These specimens he spoke of as being partly "de-patinated", and suggested to me that the basket-work patination was the remains of a former wholly white surface.

In some instances the unflaked cortex of the specimen also exhibits the basket-work patination, though it is not so noticeable here as upon the flaked surfaces, and after full consideration of the whole problem, I incline to the opinion that this peculiar coloration has been due to root action. Though why such action should have manifested itself so markedly in Early Mousterian times is at present an insoluble problem. The other specimens in group *B* that are coloured white, or blue, can be explained upon the supposition that they had lain upon a land surface for a sufficient period to have these colours imposed upon them, and were then incorporated with the non-staining deposits beneath, and in which they are now found. The Neolithic implements included under group *C*—which do not show any colour changes of their flaked surfaces—may be regarded as those which have not been exposed to atmospheric conditions long enough to allow the patinating process to have any effect upon them. Thus, in these three groups of implements, we see that the earliest distinctly tend to exhibit an ochreous colour, that the less ancient not to show this tendency, but exhibit a "basket-work", or blue or white patination, while the latest of all do not show a colour change of any kind.

Sometimes one finds in a very ferruginous deposit flaked flints which are either blue or white in colour, and these have evidently not been stained by the material surrounding them. At first sight this appears very difficult to explain, but an examination of these particular specimens will generally show that their flaked surfaces carry a well-marked glaze, and when this has been imposed upon a flint, it appears to make it impervious to any further staining agents. The origin of this glaze upon flints, which is best seen upon the well-known specimens from Savernake in Wiltshire, is at present unknown, but various suggestions, such as the action of blown sand, or of running water, with sand in suspension and re-



deposition of silica, have been put forward to account for it. So far as I am aware, there is no definite evidence in existence to show that flints are patinated a white, or a blue colour, while buried deeply beneath the surface. On the other hand there would appear to be very good reason to believe that these colours are imposed on specimens lying either upon, or just beneath, that surface. In the first place, in many parts of the country, there are to be seen upon the surface of the fields, vast "spreads" of flints exhibiting a blue, or a white, coloration, which would seem to point to the fact that the patination of these specimens took place in the position where they are now found. Secondly, in one of the great workshop floors which I investigated at the famous flint mines at Grime's Graves, Norfolk, where the mass of the flakes, and broken pieces, averaged three to four feet in thickness, it was noticed that the flints nearest the surface of the ground were white on both surfaces, those a little lower down were white on the upper surface—and blue underneath—those lower still, were blue on the upper surface and black underneath, while those at the bottom, resting upon the white chalk were black and unchanged on both surfaces. This evidence seems to show clearly that the agent of patination was acting from above downwards, and that its effect became less and less, and finally ceased at a depth of about 3 feet from the surface. Incidentally this discovery also shows that, at the site investigated, the white chalk did not whiten the flints in contact with it. Unfortunately, we do not know what it is in nature that patinates flints, but it is evident that some widespread cause has been, and no doubt is still, in operation. It has been suggested that rain water, charged with  $\text{CO}_2$ , might in the course of a prolonged period produce patination on flints, and this view would seem to be in a measure supported by the apparent slowness with which the process acts. For instance, an examination I have carried out of numerous churches and other ancient buildings, built of dressed flint, has failed to reveal to me any really noticeable colour change in the exposed surfaces of the stones, and the latest flint implements found upon the present land surface, which must have been exposed there for several thousands of years, are not patinated. The only experimental evidence known to me, which perhaps supports the idea that

rain water, charged with  $\text{CO}_2$ , has been the cause of the patination of flints, was provided by the late Dr Canton, who placed some newly broken, sound, black flints in a gasogene for about 12 months, and at the end of that time a very slight bluish tinge was to be seen upon portions of the surfaces of some of the specimens. It is known that certain flints dug from the chalk by the gun-flint makers of Brandon—show, soon after having been broken and exposed to the air—a bluish tinge, but regarding this, it can only be said that this is not the case with other specimens from different parts of the country. The flints found in the workshop floor at Grime's Graves, already mentioned, that show a dense white patination on their upper surface, and a light blue upon the lower, are what is known as "doubly-patinated" specimens, a somewhat unsatisfactory term. Now experiment has shown that the most patinated is the softer surface of such a flint, and in any vicissitudes through which the specimen passes, such as rolling in a river-bed or being subjected to striation, the fact of the differing hardness of the two surfaces will make itself manifest. Thus, it is possible to see some Palaeolithic implements, exhibiting two unequally patinated surfaces, that show on the softer side much wear and deeply-marked striae, while the other harder surface is comparatively unaffected. The difference in appearance of the two sides is, in fact so great, that unless a careful examination is made, the conclusion might be drawn that the deeply-patinated surface is actually much older than the other. Occasionally one sees an implement where the two surfaces are of different ages, but in my experience this is rather rare. There would seem to be no doubt that the effect of patination is to slightly dissolve the surface of a flint, and I have seen specimens, taken from an undisturbed occupation-level, of which the upper-patinated side appeared to have been subjected to a slight amount of attrition by rolling, but which was due solely to the effect of patination. In every case which has come under my notice of doubly-patinated flints occurring in an *undisturbed* floor, the patinated side of the specimen has always been that which is nearest to the surface soil, and, if this is true in all cases, then we know that, when we find a Palaeolith in a deposit of gravel, which shows a double patination, this specimen was originally on, or just beneath a land



surface, with the side that is most patinated uppermost. In the Warren Hill gravel in north-west Suffolk there are found a large number of Palaeolithic implements exhibiting double-patination, and many which show a peculiar speckled, yellow and black, coloration. In most cases, this latter appearance has been produced by the flint first being struck by other stones—during rolling by water action—and incipient cones of percussion formed in its surfaces. These bruises have afforded areas where the patinating agent would take effect—while the other unbruised portions of the flint show no colour change. The whole question of the “patination” of flint should be investigated in detail by competent chemists and physicists, and, until this is done, we shall not attain to any real understanding of what is, without doubt, a very important and practically unexplored subject. This matter has been dealt with in its wider aspects by various authors, reference to whose works will be found below.<sup>1</sup>

Another subject, which is of a somewhat technical character, is that which deals with the peculiarities of fossil bones. Most of those who are engaged in the investigation of ancient flint implements, from time to time find these specimens associated with mammalian remains, and their examination, by revealing the type of animals represented, enables the archaeologist to form a very good idea of the nature of the climate existing at various periods in the past. Thus, an assemblage of creatures, such as is known could live only under cold conditions, points to the prevalence of a low temperature at the time when these animals roamed the country, while, if the specimens recovered belonged to creatures favouring a warm climate, an opposite conclusion is indicated. But, in addition to these important determinations, an examination of the condition of the bones themselves will be found to be of much interest, and a short consideration of this matter would appear to be desirable.

As with the colour changes in the surfaces of broken flints, very little is known regarding the natural processes that give rise to the remarkable condition of certain ancient bones,

<sup>1</sup> Johnson, Walter and Wright, William, *Neolithic Man in North-East Surrey*, Elliot Stock, London, 1903, pp. 178–184; Hewitt, H. Dixon, *Proc. P.S.E.A.* vol. II, pt 1, pp. 45–51; Sollas, W. J., *Ancient Hunters and Their Modern Representatives* (3rd edition), Macmillan, London, pp. 81–82.

## THE COLOURS OF FLINT IMPLEMENTS

known as fossilisation.<sup>1</sup> I have shown above, that, with flint implements, those exhibiting a deeply ochreous or mahogany-brown colour, are generally of a very high antiquity, while others showing "basket-work" patination, or a blue or white coloration are, in the great majority of cases, of less age. It was shown, also, that the most primitive and ancient implements exhibited the deepest ochreous shade, those of less antiquity the other colours mentioned, while with the least ancient of all, no colour change has taken place in their surfaces. Finally, it was suggested that the processes responsible for the imposition of these various colours appear to have acted with ever decreasing intensity from the Pliocene period to the end of the Stone Age.

When we turn to the study of fossil bones, a somewhat similar picture presents itself. If, for example, an examination is made of a series of such specimens from (*a*) the Suffolk Bone Bed, (*b*) the Cromer Forest Bed of Norfolk, (*c*) the Hoxne deposits, and (*d*) the lower of two occupation-levels in a small valley to the north of Ipswich, it is seen that, speaking generally, the oldest deposit (*a*) contains the greater proportion of the most ancient types of mammals, while (*b*) which is of a less antiquity, contains a smaller proportion of such types, and so on. Thus the geological and the palaeontological evidence is, in the examples quoted, in agreement, and shows that, according to the age of the deposit, so the proportion of ancient types of mammals in it varies. The condition of the bones from horizons (*a*), (*b*), (*c*), (*d*) also supports these conclusions, for a study of the specimens will show that the most ancient are more fossilised than those of later date. In order to establish this claim, I give below the result of an analysis, carried out by Herapath<sup>2</sup> of certain bones from deposit (*a*), and of others from deposit (*d*), which were examined in recent years by Messrs E. Packard and Co., Ltd., of Bramford, near Ipswich.<sup>3</sup> In the former case, the bones were found to contain 4·9287 per cent. of organic matter, while the latter contained 20·85 per cent. of this material. Several interesting points arise from the above analysis. It seems, in the first place, that, in most

<sup>1</sup> Moir, J. Reid, *Science Progress*, April, 1927.

<sup>2</sup> *Geological Survey Memoir*, "The Geology of the Country around Ipswich, Harwich and Felixstowe", p. 103.

<sup>3</sup> Moir, J. Reid, *Journ. Roy. Anthr. Inst.* vol. XLVII, July to December, 1917, p. 385.



cases, the age of any given specimen has a very definite relationship to its state of fossilisation, and that any bones embedded in a deposit of the type of the Suffolk Bone Bed, will, whatever their history may have been prior to such entombment, in the course of sufficient time assume a uniform fossilised condition. For the Suffolk Bone Bed is made up of constituents of widely different ages, and its contained bones must have had very varied histories before reaching their present resting-place. It is not reasonable to suppose that these bones—during their pre-Bone Bed existence—had all been lying in the same kind of deposit, nor exhibited a similar fossil state upon their arrival in the Bone Bed, yet their condition now shows very little variation, and is one of advanced fossilisation. Thus, we must conclude that during the period of time, possibly 500,000 years since they were washed into the Suffolk Bone Bed, the difference in their states of fossilisation has been overcome so that they now all contain about 5 per cent. of organic matter. It would be of much interest to ascertain—if such a thing were possible—whether the process of fossilisation is, at the present time, proceeding in the Suffolk Bone Bed, and to be able to form some opinion as to the possibility if, after a further great lapse of time, the bones would have lost the whole of their organic matter. It may be, however, that the 5 per cent. of this material—which the specimens have retained—represents the minimum capable of being reached under the conditions to which the Bone Bed relics are subjected. If we imagine—as seems highly probable—that certain of the specimens entered this deposit when in a fresh condition, we must conclude that a period of possibly 500,000 years has been necessary to remove most of their organic matter. On the other hand it was found that fresh bones contained 30·78 per cent. of organic matter, while the specimens from deposit (*d*), which was probably laid down about fifteen to twenty thousand years ago, contained 20·85 per cent. of this material. Thus, in the period of time mentioned, these bones have lost about 10 per cent. of organic matter, and, if it may be regarded as normal for fresh bones to contain 30 per cent. or thereabouts, then it is clear that the process of fossilisation must have proceeded with much greater rapidity in bed (*d*) than in bed (*a*). It is possible, however,

that this process of fossilisation acts upon a *fresh* bone, at first with rapidity, and afterwards with decreasing speed, until, finally in some cases, and for some unknown reason, it ceases without having eliminated the whole of the organic matter from the specimen. This, I admit, is largely speculation, but the facts quoted above seem to point to some such explanation. But the manner in which the bones in different conditions of fossilisation upon their arrival in the Suffolk Bone Bed, have, under the circumstances obtaining in that deposit, been all brought to a comparable condition, is very difficult to understand, and presents a highly complex problem for solution. The suggestion that the process of fossilisation acts upon a fresh bone with considerable rapidity, is supported by the work of A. F. Rogers,<sup>1</sup> who thinks it probable that bones become fossilised in a comparatively short time, and afterwards no further fossiliferous changes of importance take place. It has been widely held that fossil bones are, generally, silicified, but this has been disproved by Rogers who has made a close examination of 300 different examples, ranging in age from the Ordovician to recent times, and collected from various countries in every continent. This examination has shown that fossil bone consists, almost entirely, of the amorphous mineral colophane, which is also the principal constituent of phosphate rock. Rogers' work represents a distinct advance in our knowledge of the fossilisation of bone, but there are many problems yet remaining to be solved. For instance, the manner in which, and by what means, the organic matter is removed from the pores of the bone, and its place taken by colophane, thus preserving the structure, is not, so far as I am aware, ascertained. Another unexplained phenomenon is the remarkable change in condition undergone—with comparative rapidity—by bones removed from certain deposits of brick-earth. In many cases, these specimens, when first found, are literally as soft as bread, and need the most careful handling, but, after exposure to the air for some time, they become quite hard, and can be handled with impunity. This process of exposure allows the bones to dry, but it would not appear that the mere evaporation of the contained moisture is alone sufficient to account for the marked change in the condition

<sup>1</sup> Rogers, A. F., *Bull. Geol. Soc. America*, vol. xxxv, 1924, pp. 53, 56.



of the specimens. Those who have had experience in discovering ancient bones will know that sometimes a process, the very reverse of that just described, is noticeable, viz. that the specimens when found are more or less hard, but on exposure to the air become soft, and often crumble at the slightest touch. This latter condition is, I think, more frequently met with than the former, but both are of considerable interest, and the exact reasons for them should be investigated. It would seem probable that the material in which the bones have lain may have a good deal to do with their behaviour on exposure to the air, as the nature of their matrix has certainly determined the state of preservation of many specimens. In the case of bones from deposit (*d*), it was found that, where this was a calcareous clay, the specimens were well preserved, while, where the bed was composed of sand, they were in a most fragile state. Water was present in quantity, both in the clay and in the sand, so it is evident that moisture itself had nothing to do with the condition of the bones. Some years ago I carried out a series of experiments in the fracture and the shaping of bone,<sup>1</sup> and found that in the case of fossil examples from the Suffolk Bone Bed, it was next to impossible to produce any desired form by blows with a hammer-stone. The specimens fractured usually along their natural grain and in a splintery manner. The bones were very highly fossilised, and in one or two examples, I actually produced a pseudo-cone of percussion, such as is formed by a blow upon flint and other similar substances when breaking them. It is interesting to note that, as with flaked flints, the bones from bed (*a*) exhibit a very deep mahogany-brown colour, while those of later date are not stained so deeply. This coloration is certainly due to the material in which the specimens have lain, and depends chiefly upon the amount of salts of iron contained in this material. The bones from bed (*a*) also often show a very high polish upon their surfaces, but the origin of this is obscure. In these few remarks I have merely drawn attention to some of the problems with which those who make a study of fossil bones are confronted. The solution of these problems must be undertaken by chemists and others possessed of the wish and the necessary knowledge to explore a little-known region of science.

<sup>1</sup> Moir, J. Reid, *Proc. P.S.E.A.* vol. II, pt I, pp. 116-131.

## CHAPTER VIII

### *A Remarkable Suffolk Valley*

AFTER the last great ice-sheet had swept across most of England, and buried deep beneath glacial deposits the flint implements of the older Palaeolithic races, the climate began to improve, and before long, vast herds of animals advancing from the south, and feeding upon the vegetation that had once more appeared, occupied the country. Following the animal population came parties of prehistoric men who took up their abode in caves and overhanging rock shelters in Derbyshire, Devonshire, Somerset, and Wales, while, in other parts of England, where these natural refuges did not exist, encampments were made in the open, preferably in well watered and sheltered valleys. The English climate then was like that of the Continent, somewhat cold and dry, with high winds, which, in exposed and sandy places, carried away the surface soil and deposited it on the low lying grounds. It was under conditions of this kind that Late Palaeolithic man lived, a companion of the gigantic mammoth, the woolly rhinoceros, bison, bears, hyaenas, and several kinds of deer. Though he was a great hunter and expert in the flaking of flint, and in the shaping and carving of bone and ivory, yet we look in vain in the remains of his encampments for those massive hand-axes and other implements which speak so eloquently of the primitive virility and strength of his ancestors. Man had in fact entered upon a new stage, and had become more civilised.

He was using the lance with a cunningly-made bone point: he had almost certainly invented the bow and arrow: he was a fisherman, and had no doubt also conceived many ways, unknown to the earlier peoples, of trapping large animals. The Late Palaeolithic epoch lasted for about 20,000 years and is chiefly remarkable for the artistic sense shown by the people of those days. For they carved the outlines of animals in bone and ivory, and painted hunting scenes on the walls of the caves in which they lived. Many of these efforts are of real artistic value, and are extraordinary when it is realised when they were



executed, and the primitive means available for such work in those remote times. Outlines of various animals have been found upon fossil bones in the Cresswell caves in Derbyshire,<sup>1</sup> while in Suffolk, and at Grime's Graves in Norfolk, flints and other stones have been discovered bearing similar outlines upon their surfaces. The flint implements of this epoch are not of great size but they are in many cases beautifully made, and comprise—scrapers of various forms, planes, wonderful leaf-shaped blades, points, and flints called *burins* specially flaked for use in engraving. There were three well-defined stages of Late Palaeolithic times in which the implements and artistic productions differ, and these stages are known as the Aurignacian, the Solutrean, and the Magdalenian.

In the northern part of Ipswich, between the Henley and the Norwich roads, is situated the brickfield of Messrs A. Bolton and Co., Ltd., where the Eocene London Clay is excavated and manufactured into red bricks. The brickfield lies in a small streamless valley which has been found to be extraordinarily rich in vestiges of the past races of East Anglia. It has been my privilege to examine and conduct excavations in this valley, by the kind permission of the proprietors, for many years past, and a great deal is now known about its geological and archaeological history. The valley itself, though so near to the town of Ipswich, presents on its southern side much beauty and wildness, and is the home of many interesting and beautiful birds. It begins as a slight depression in the plateau to the east of the Henley Road, and gradually deepening and developing a somewhat sinuous course, joins the main valley of the River Gipping about a mile to the westward.<sup>2</sup> The valley is typical of many such in Suffolk, and owes its initial formation to the melting of the glacier that laid down the Upper Boulder Clay of East Anglia. The waters set free during this process would naturally find their way into the main drainage valley close by, and there is evidence, in the form of the valley under consideration, that it did this with considerable rapidity. In this first stage of its erosion the valley cut through the various beds forming the plateau, comprising, in downward order,

<sup>1</sup> Armstrong, A. L., *Journ. Roy. Anthr. Inst.* vol. LV, 1925, January to June, pp. 146-175.

<sup>2</sup> Moir, J. Reid, *Journ. Roy. Anthr. Inst.* vol. XLVII, 1917, pp. 367-412.

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Upper Boulder Clay, "Middle" Glacial Gravel and Red Crag Sands, while the underlying London Clay was deeply eroded. The first three of these deposits are exposed by the commercial excavations carried on in the brickfield, and have, as has already been shown, yielded flint implements of Lower Palaeolithic, and of pre-Palaeolithic age. In the diggings on the north side of the valley an extensive Roman Cemetery has been found, together with traces of the Neolithic, Bronze, and Iron Age civilisations, while, immediately under the turf was discovered a seventeenth century cavalry sword. When the ice of the Third Glacial epoch had disappeared, and the first stage in the formation of the valley completed, the land of East Anglia was, probably, standing somewhat higher than it does at present, and the valley itself must have exhibited a very different appearance from what it does to-day. It was then very sandy, and on its sides grew a large number of pine trees (*Pinus sylvestris*), while at places springs of water issued from its flanks. The climate was probably still cold, but large forests existed in the neighbourhood, and the mammoth, wild horses, various kinds of deer, and oxen roamed about the country. There was thus every inducement for man to occupy this well-watered and sheltered valley near Ipswich, and there is abundant evidence to show that this occupation took place. The period was that which occurred after the recession of the ice of the Third Glacial epoch when Mousterian man was inhabiting western Europe, and the people, whose remains we are now to consider, were probably his successors in East Anglia. The diggings I have carried out in the valley have demonstrated that, in the deposits now cloaking its sides, there exist two superimposed and ancient land surfaces or "floors", in which abundant remains of prehistoric man have been found. The people who occupied the lower occupation level entered the valley when it presented the appearance I have described above, and they evidently remained there for a considerable space of time. This Lower Floor has been found to be present on both sides of the valley, and in most cases rests upon sand. Numerous flint implements, some of which are made of rocks other than flint, and quantities of flakes have been recovered from this horizon, together with hammer-stones made of quartzite pebbles, and the cores from which the flakes have



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been struck. On the old land surface extensive hearths have also been found, in which much charcoal and large numbers of burnt flints occur. The preponderating character of the

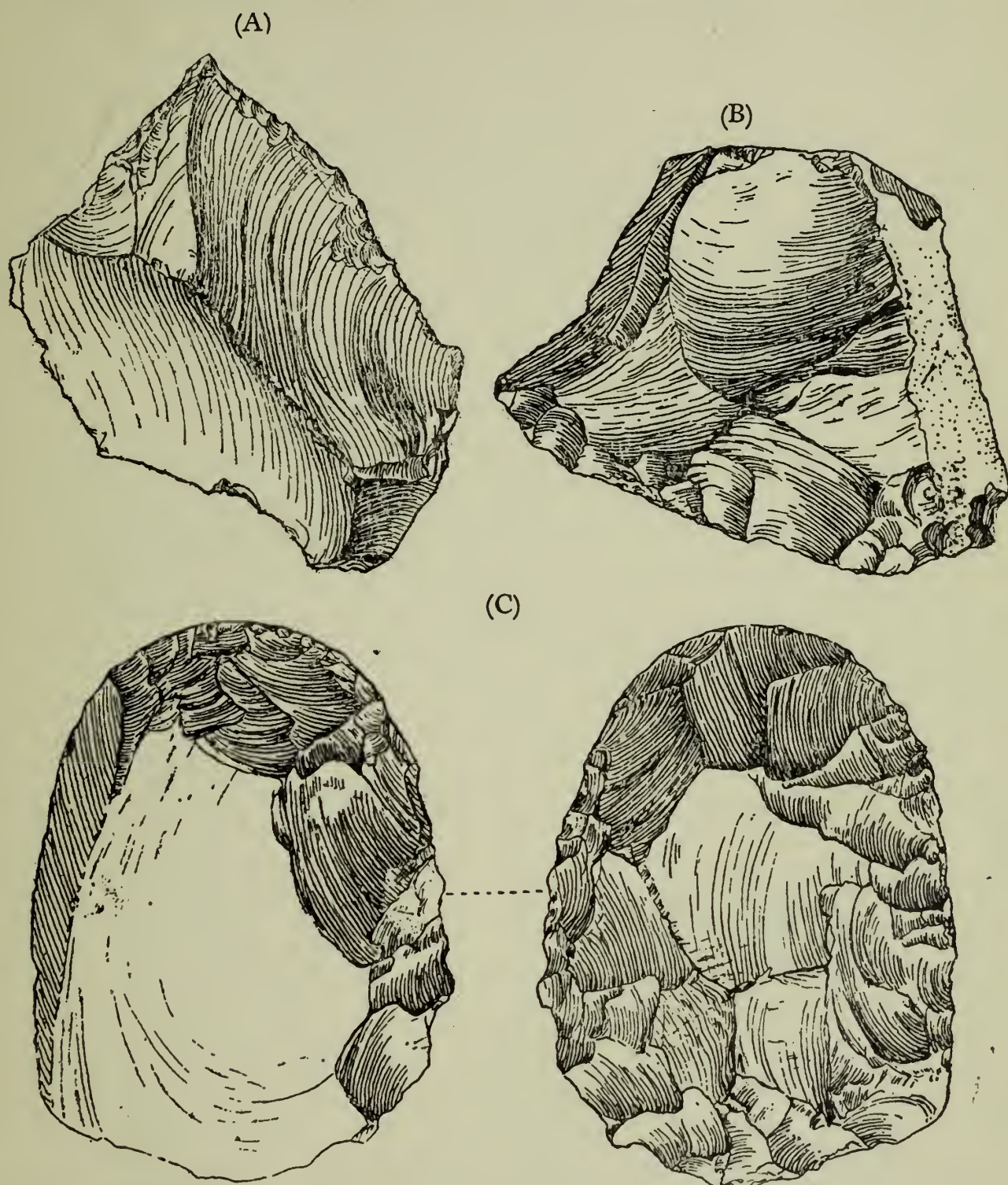


Fig. 32. Flint implements from the Lower Floor in Messrs Bolton and Co.'s brickfield, Ipswich. (A) point, (B) fan-shaped racloir, (C) Hand-axe. (Nat. size.) *R.A.I.*

flint implements of the Lower Floor is apparently that of specimens referable to the beginning of Upper Palaeolithic times. The artifacts, which are quite sharp and unabraded, and have suffered no colour change of their surfaces, comprise small hand-axes (Fig. 32 C), knives with curved back and more



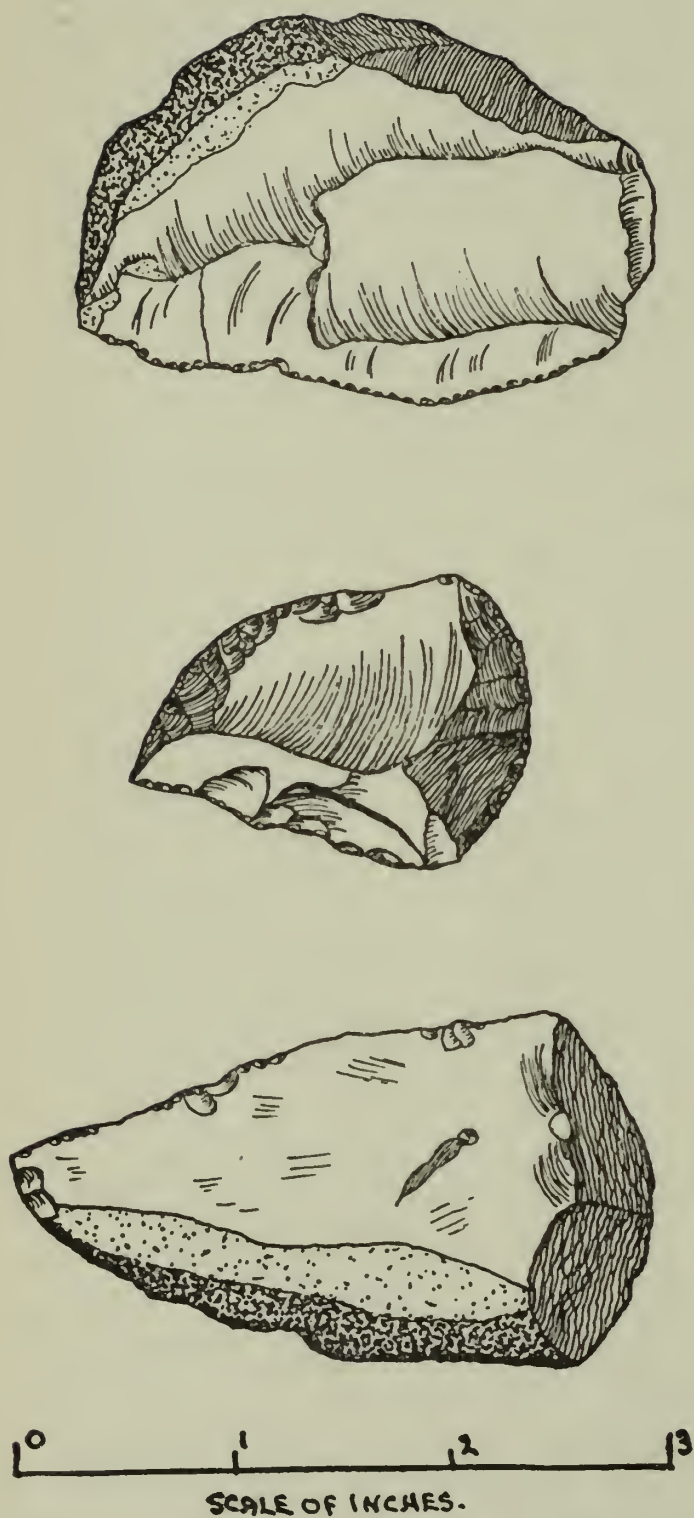


Fig. 33. Flint knives, similar to Abri Audi points, from the Lower Floor in Messrs Bolton and Co.'s brickfield, Ipswich.

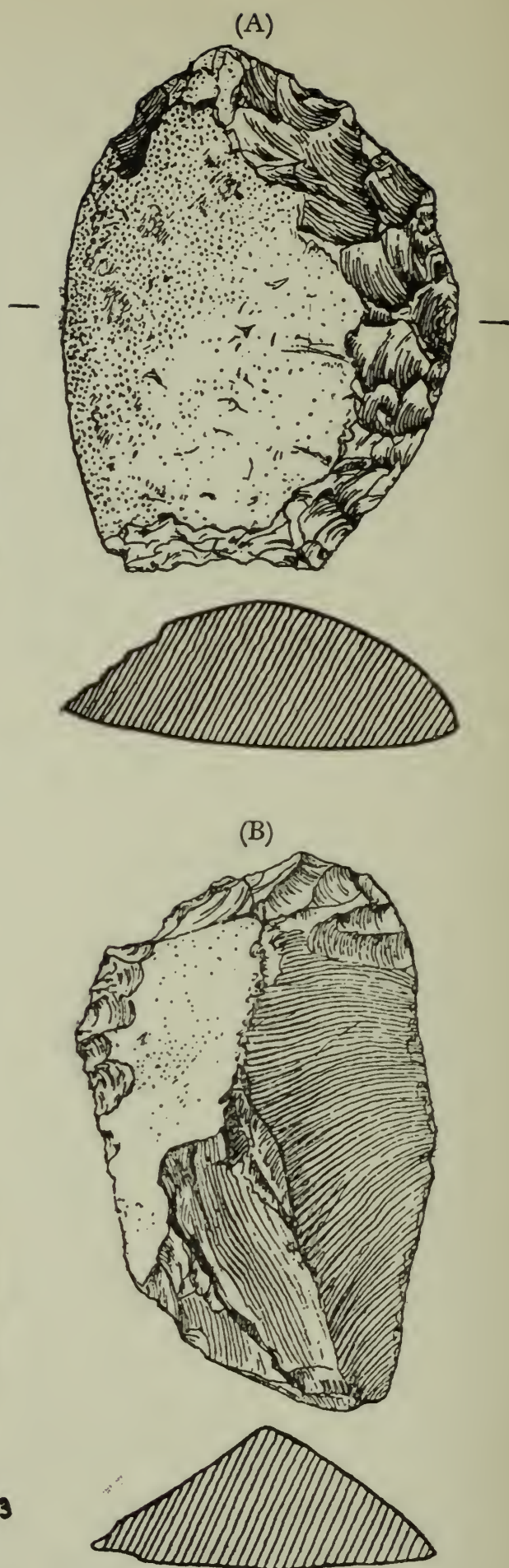


Fig. 34. Flint implements from the Lower Floor in Messrs Bolton and Co.'s brickfield, Ipswich. (A) racloir, (B) scraper. (Nat. size.) R.A.I.



or less straight cutting edge (Fig. 33), well-made scrapers (many of which are of the so-called rostrate type), points, racloirs (Figs. 32 and 34), some primitive *burins* or graving tools, and numerous flakes, many of which exhibit typical faceted striking-platforms. With these have been found two examples of small *tranchet* axes such as are found in quantity in Early Neolithic times, but it is known, from discoveries made by M. Peyrony at Le Moustier, that this type of implement had already appeared in the Mousterian-Palaeolithic period, and I am of opinion that the implements of the Lower Floor in the valley must, by their forms and flaking, be referred to either a very late Mousterian phase, or to the beginning of the succeeding Aurignacian, and to represent perhaps in a slightly modified form, the implements of this epoch found in France. A representative series of the specimens was submitted to Professor Commont, the well-known French archaeologist, who definitely supported the above view, and expressed the opinion also, that the implements from the Upper Floor in the valley belonged to a phase of the Aurignacian culture, while two blades found in the hill-wash overlying the Upper Floor must be assigned to an early portion of the succeeding civilisation—the Solutrean. On the other hand Professor Breuil is of opinion that the two floors are of Early Neolithic age and the two blades referable to Bronze Age times. At two places in Messrs Bolton and Co.'s valley the Lower Floor contains pieces and fragments of a very rough and hitherto unknown type of pottery (Fig. 35). The vessels were evidently very large, but the exact use to which they were put is problematical, and their occurrence in association with flint implements of Palaeolithic type, and the remains of the mammoth constitutes a very unusual state of affairs. The prevailing view among archaeologists is that the manufacture of pottery did not begin until the Neolithic, or last phase of the Stone Age, but I regard it as improbable that the well-made vessels of Neolithic times represent man's first efforts in the potter's craft. It is true that, so far, Palaeolithic pottery has not been recorded from any of the well-known sites in France, but it is otherwise in Belgium where, at several places, the remains of clay vessels have been found in Upper Palaeolithic deposits.<sup>1</sup>

<sup>1</sup> *Bull. Soc. préhist. de France*, 1907-8 (two papers).



In the south-west portion of Messrs Bolton and Co.'s brickfield a number of interesting and important discoveries were made. There was evidently a copious spring of water present there in the days when the Lower Floor was occupied by man, and this fact no doubt accounts for the very large number of relics which were discovered at this spot. The site was clearly a place where animals killed in the chase were cooked and eaten, for, over a considerable space, quantities of bones, many of which were cut by flint knives and split open for the extraction of marrow, were unearthed. With these remains were found flint implements, some evidently used for breaking open

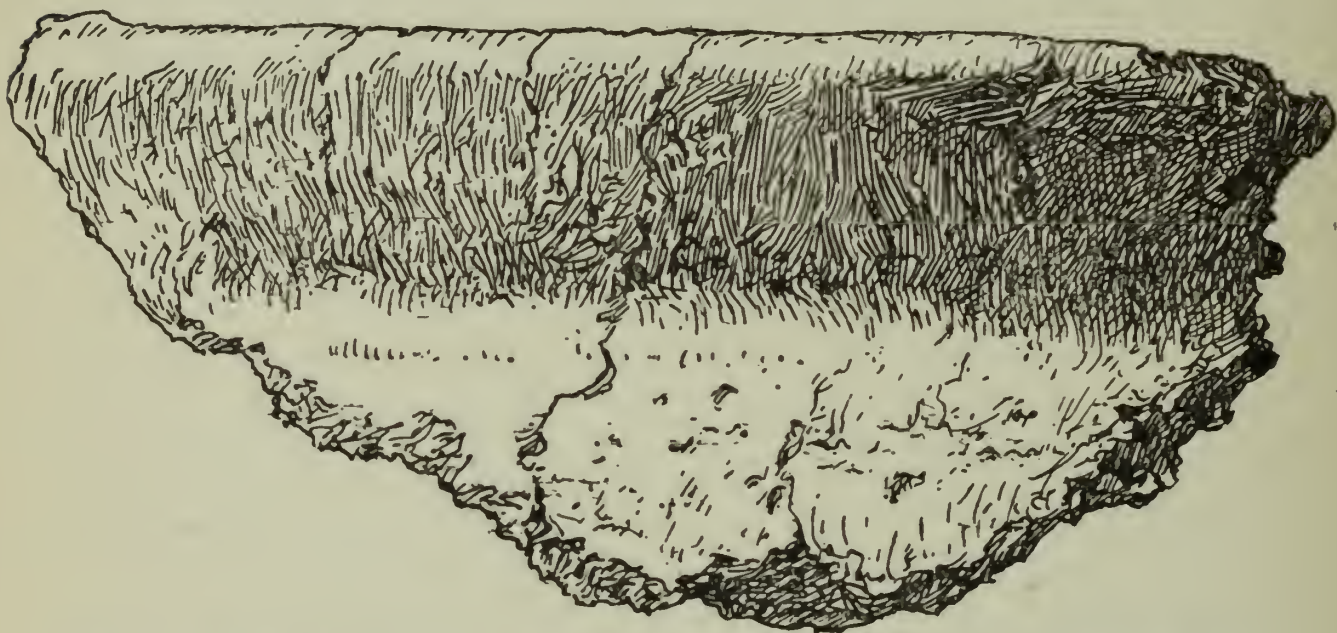


Fig. 35. Lip and shoulder of a large vase found in the Lower Floor in Messrs Bolton and Co.'s brickfield, Ipswich. ( $\frac{3}{8}$  Nat. size.) R.A.I.

bones, also many burnt flints, and it is clear that these relics represent the debris of a prehistoric "kitchen". Associated with the animal bones were found three portions of the human skeleton, viz. parts of a thigh bone, a humerus, and a fragment of a very thick skull (not all referable to one individual), which in the case of the long bones, exhibit cuts and marks of scraping and gnawing, in every way comparable with those upon the mammalian remains. Thus, it appears evident that the occupants of the Lower Floor indulged, occasionally, in cannibalism. The animals represented in the Lower Floor are *Elephas* (? species), *Cervus megaceros* (?), *C. elaphus*, *C. capreolus*, *Equus robustus*, *Equus prejevalskii* (?), *Equus* (? species), *Bos longifrons*, *Sus scrofa*, *Capra hircus*.

Following upon these excavations in the south-west portion





Fig. 36. Early Mousterian side-chopper from glacial clay in Messrs Bolton and Co.'s brickfield, Ipswich. (Nat. size.) *P.S.E.A.*

## A REMARKABLE SUFFOLK VALLEY

of the brickfield, I decided to carry out deeper diggings in order to investigate the underlying beds. This work was undertaken, and a remarkable section exposed.<sup>1</sup> At the bottom the Eocene London Clay was uncovered to a depth of 8 feet, and resting upon this were the following beds which are given in ascending order:

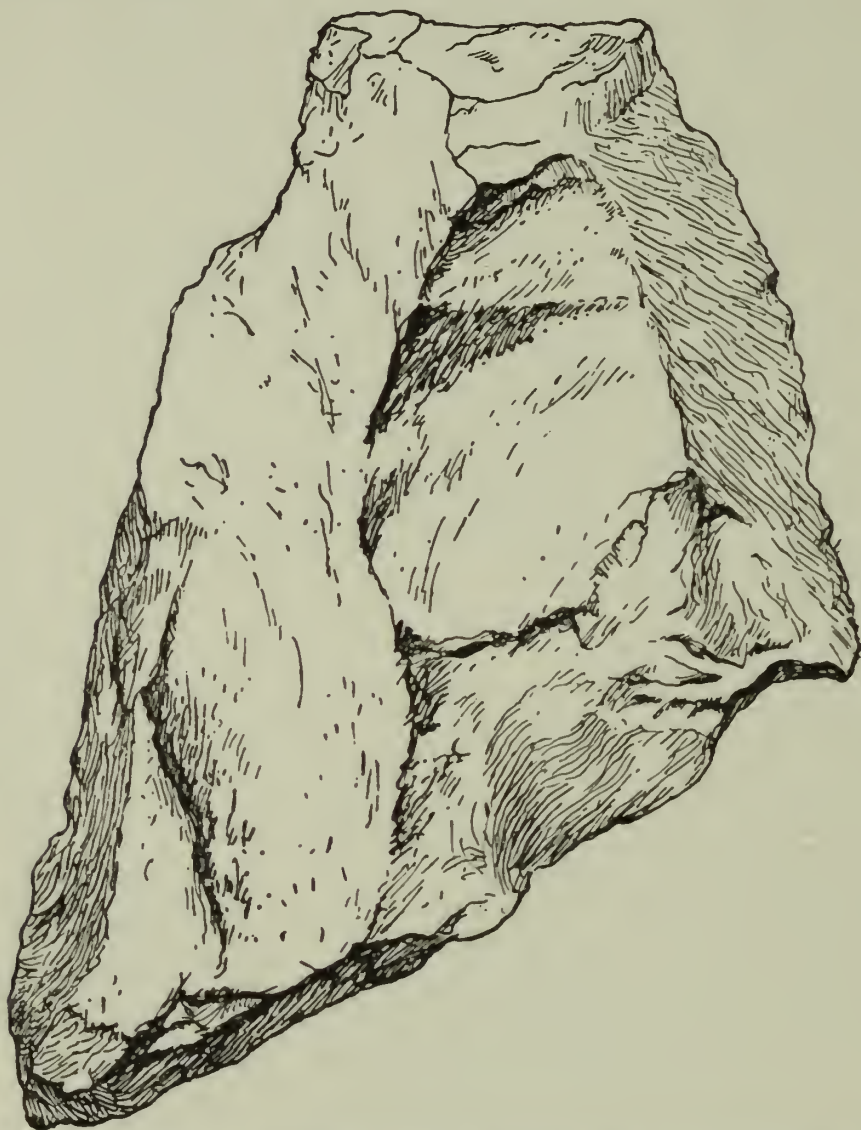


Fig. 37. Quartzite scraper found in upper part of glacial clay in Messrs Bolton and Co.'s brickfield, Ipswich. (Nat. size.) *P.S.E.A.*

- (1) An ancient occupation-level (Floor A) containing only indeterminate flakes, and some burnt flints.
- (2) Lower Boulder Clay (the equivalent of that underlying the Palaeolithic deposits at Foxhall Road, Ipswich, Hoxne, and High Lodge) to 8 feet.
- (3) An ancient occupation-level (Floor B) containing a typical Mousterian side-chopper (Fig. 36) together with scrapers, push-planes, numerous flakes, and some quartzite hammer-stones.
- (4) Bluish, sandy loam, roughly stratified to  $2\frac{1}{2}$  feet.

<sup>1</sup> Moir, J. Reid, *Proc. P.S.E.A.* vol. III, pt 4, pp. 559-579.



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- (5) Clay, resembling London Clay in appearance, though of much later date—to 6 feet.
- (6) In the upper part of this clay occurred traces of another occupation-level from which was recovered a well-made scraper in quartzite (Fig. 37).
- (7) Clay, with many flints = ? Upper Boulder Clay, to 1 foot.
- (8) Floor C (the Lower Floor described above, of Late Mousterian or Lower Aurignacian age).
- (9) Peat to 9 inches.
- (10) Stoneless Loamy Sand to 3 feet.
- (11) Floor D (the Upper Floor described above) of Upper Aurignacian age.
- (12) Stony Hill-wash, containing Early Solutrean blades—to 8 feet.
- (13) Surface soil, with Neolithic implements—to 1 foot.

Thus, at this one spot, there is present a series of super-imposed deposits, containing flint implements ranging from Mousterian to Neolithic times, and averaging 30 feet in total depth. This page in man's past history represents, probably, a period of about 40,000 years.

There is a great probability that even our remote ancestors had to face a housing problem, such as is present in most civilised countries at the present day. The supply of caves and rock shelters, where these ancient people mostly lived, must have been greatly exceeded by the demand, even in places where such natural habitations existed, but in open country, these refuges were not present, and man had perforce to start building on his own. There is not much doubt that, in these first attempts to provide himself with shelter, he would turn naturally to wood, which was plentiful in certain areas in prehistoric times, and could be roughly shaped by flint axes and planes. It seems equally probable that the first wooden "house" took the form of a small palisade, fixed into the ground, behind which it would be possible to be protected from the wind, and where, with a fire blazing, a considerable amount of warmth and comfort would be experienced. These suppositions find support in the known use, by the primitive Australians, of a simple "wind-screen", composed of a number of pieces of wood and of branches rising to a height of several feet above the land surface.<sup>1</sup> The material forming the shelter was fixed together with sufficient closeness to afford adequate protection against the wind, but such habitations possessed no roof, nor enclosing sides, and could be taken up and carried

<sup>1</sup> Sollas, W. J., *Ancient Hunters and Their Modern Representatives* (3rd edition), p. 274.

away, when the tribe moved to a new camping ground. In the remote past the weather was, at times, by no means genial, and even the hardy mammoth-hunters would require some sort of shelter to which to retire when night was coming on. The extensive remains of the lake-dwellings, referable to the end of Stone Age times, about 5000 years ago, show conclusively, that wood was utilised largely at this period, but vestiges of terrestrial habitations made of this material, and of prehistoric age, have been met with but seldom. This is, without much question, due to the fact that wood, unless subjected to certain favourable geological circumstances, disintegrates and disappears in a comparatively short space of time. Speaking generally, if such remains are covered by water-logged material they will be preserved, but if their surrounding matrix is dry, preservation does not seem possible. Thus, in view of the scarcity of discoveries of any terrestrial habitations of prehistoric man, it is of considerable interest to be able to record the discovery in the Lower Floor—on the north side of the valley—of the remains of what appears to have been a wind-shelter of this period.<sup>1</sup> It is perhaps true that these remains are not such as to impress and to fire the imagination of a non-archaeological observer. Yet they are of much significance and importance, for, so far as is known, no other structure of the kind has hitherto been found. During excavations in the north-eastern portion of the brickfield there was uncovered at the level of the Lower Floor a piece of timber resembling the end of a rough plank. The surrounding area had proved rich in flint implements and flakes, and, as the strata above the wood were quite unbroken (Plate X, 1), it was realised that something unusual had been discovered, so photographs were at once taken in order to have a record of the undisturbed nature of the site (Plate X, 2). Great care was taken in uncovering the wood and when this was accomplished, a very uncommon looking structure was revealed, consisting of two pieces of blackened oak, of plank-like form, about 2 feet long, 8 inches wide, and 1 inch in thickness, which had been placed with their longer edges buried superficially in, and more or less vertical to, the surface of the underlying sand (Plate XI). The planks which, by their characteristic form, had clearly been split off a trunk

<sup>1</sup> Moir, J. Reid, *Nature*, January 9th, 1926.



LOWER PART OF REDDISH  
SAND with ferruginous concre-  
tions to 18 inches

GREY SAND dark coloured  
towards its base to 2 feet 6 inches



(1) PHOTOGRAPH OF STRATA ABOVE WIND SHELTER  
found in Lower Floor, Messrs Bolton and Co.'s brickfield, Ipswich

STONY HILL-WASH  
to 4 feet

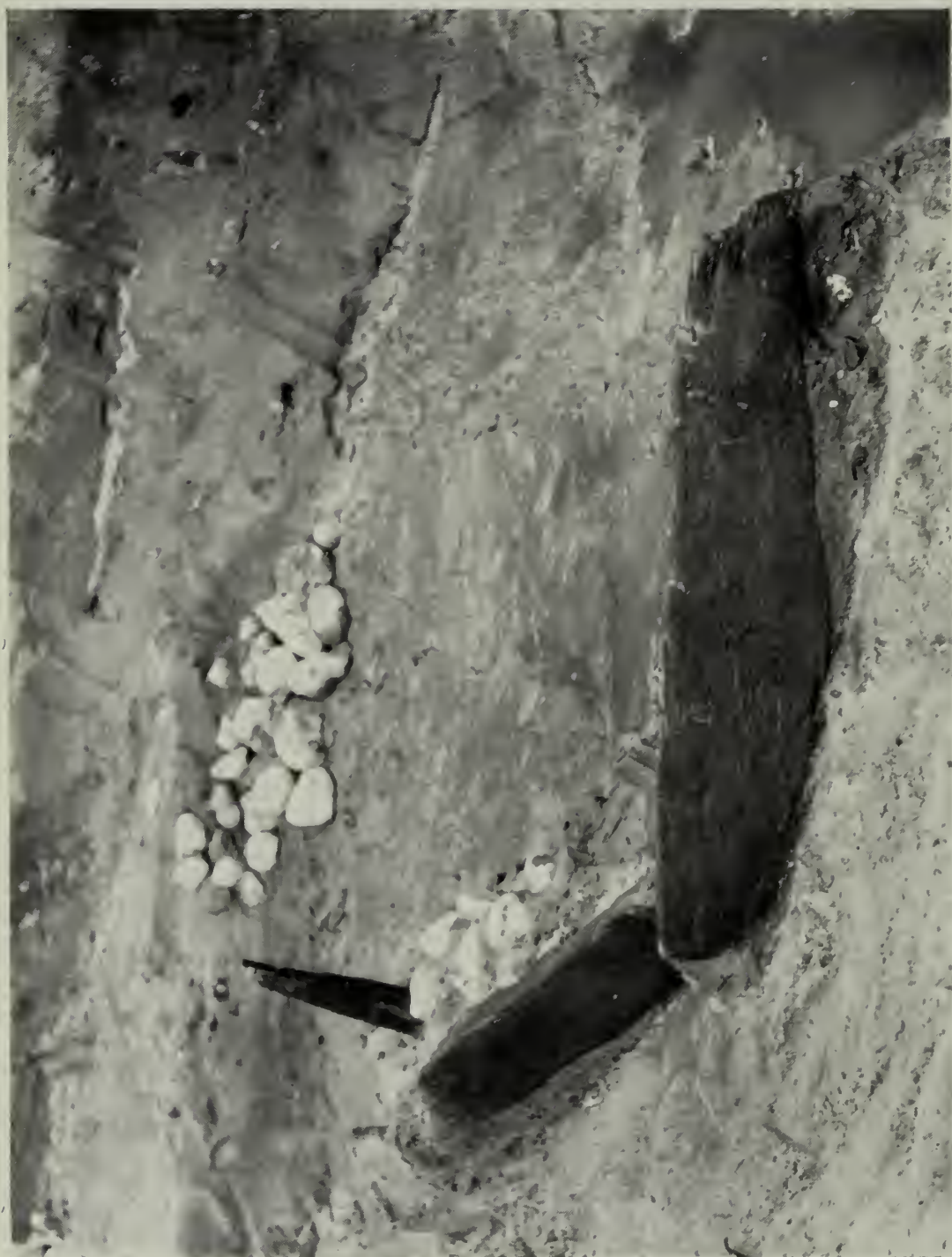
REDDISH SAND with ferruginous  
concretions to 2 feet

GREY SAND with LOWER FLOOR and  
WOODEN STRUCTURE to 1 foot

? CRAG SAND



(2) PHOTOGRAPH OF SECTION IN SIDE OF VALLEY  
immediately adjacent to site where Wind Shelter was found—  
Messrs Bolton and Co.'s brickfield, Ipswich



BASAL PORTION OF ANCIENT WIND-SHELTER *IN SITU*  
in Lower Floor in Messrs Bolton and Co.'s brickfield, Ipswich



of large size, overlapped where they met, and had, piled behind them, a mass of flints and other stones, backed up by a row of birch stakes, not closely set together. These stakes, one of which can be seen in the photograph (Plate XI), were evidently used to hold the whole structure in position. Their upper portions are missing, but the lower ends are roughly pointed, and were driven into the sand to a depth of about 1 foot. Between the planks and the supporting mass of stones were found traces of clay, in which were partially embedded portions of numerous branches, and it is supposed that the upper positions of these branches, together with those of the stakes mentioned, extended upwards for some distance above the planks, and were matted closely together so as to afford shelter from the wind. No traces were discovered of the former presence of any other sides to this structure, and it is presumed therefore that it had none, and was simply a "wind-screen" comparable with those above described, used by the primitive Australians. Almost opposite to the middle of the shelter was a heap of flints, evidently gathered together to be made into flint implements by the prehistoric occupants. Round about this heap were some quartzite hammer-stones, a large and roughly made scraper for dressing skins, a number of flint flakes and burnt flints, associated with blackened sand. The presence of these relics points to the conclusion that at this spot was an ancient habitation where flint implements were made, while the fact of the shelter facing approximately north-west, affords an indication of the direction of the prevailing winds of those remote days. About 15 yards to the west of the site of the discovery were found, at the same level, the remains of what appeared to be another shelter, but in this case, only one stake and some pieces of branches were preserved. There is no doubt that the preservation of the oak "planks" and their supporting stakes is due merely to a fortunate accident, viz. that the spot where they were erected has, in the course of time become water-logged, and this condition prevented the disintegration of the wood. But, even so, it is in a very friable state, and has had to be immersed, and kept in a suitable liquid in order to preserve it. At the level of the ancient land surface, which is in places 13 feet underground (Plate X, 2), was found a large number of flints, which, by the peculiar

cupped fractures upon their surfaces, have evidently been subjected to either extreme atmospheric heat or cold. The latter seems most probable, and points to the onset of drastic climatic conditions which may have been the cause of the evacuation of the valley by its primitive inhabitants. When this happened, their habitations would gradually decay and fall down, and finally be covered up by the deposits then forming on the sides of the valley. These deposits take the form of hill-washes of different kinds, and apparently of different ages, and are the result of the slow washing away of the finer material of the slopes, and its deposition at a lower level. There is good reason to believe that the valley has been deepened by water-action since the time when the wooden structure that has been discovered was occupied by man, and it may well be that these primitive pieces of oak and broken stakes represent remains of a habitation many thousands of years old (Plate XI).

The discovery of this ancient wind-shelter induced me to carry out some experiments in the shaping of wood with flint implements, in order to see if it were possible, by these means, to produce specimens comparable in form with those found.<sup>1</sup> The flint implements used in these experiments were flaked by me with a quartzite hammer-stone, and comprise an axe (Fig. 38 *B*), planes (Fig. 38 *A* and *D*), a pointed specimen (Fig. 38 *C*) and a flake with thick back, and a more or less straight cutting edge. The axe was mounted along the dotted line shown in Fig. 38 *B* in a split stick about two feet in length (the stone was kept in position by string tightly bound round the split portions of the stick), and I found that with this weapon I could detach branches up to three inches in diameter from trees without any great difficulty. The specimen shown in Plate XII *B* is part of the branch of an apple tree which was detached with the axe described, and shaped roughly to the form of a pointed stake, such as was found supporting the wooden structure above described. It will be remembered that this structure was formed of two pieces of oak, of plank-like form evidently split off a trunk of considerable size, and I was anxious, therefore, to see if I could produce, with flint implements, a piece of wood of plank-like form, from a branch with a more or less rounded section. The result of my attempts

<sup>1</sup> Moir, J. Reid, *Nature*, May 8th, 1926.



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to do this is illustrated in Plate XII C, and it will be seen that I was successful in my efforts. The branch was first of all split longitudinally four times with the axe, so that the outer

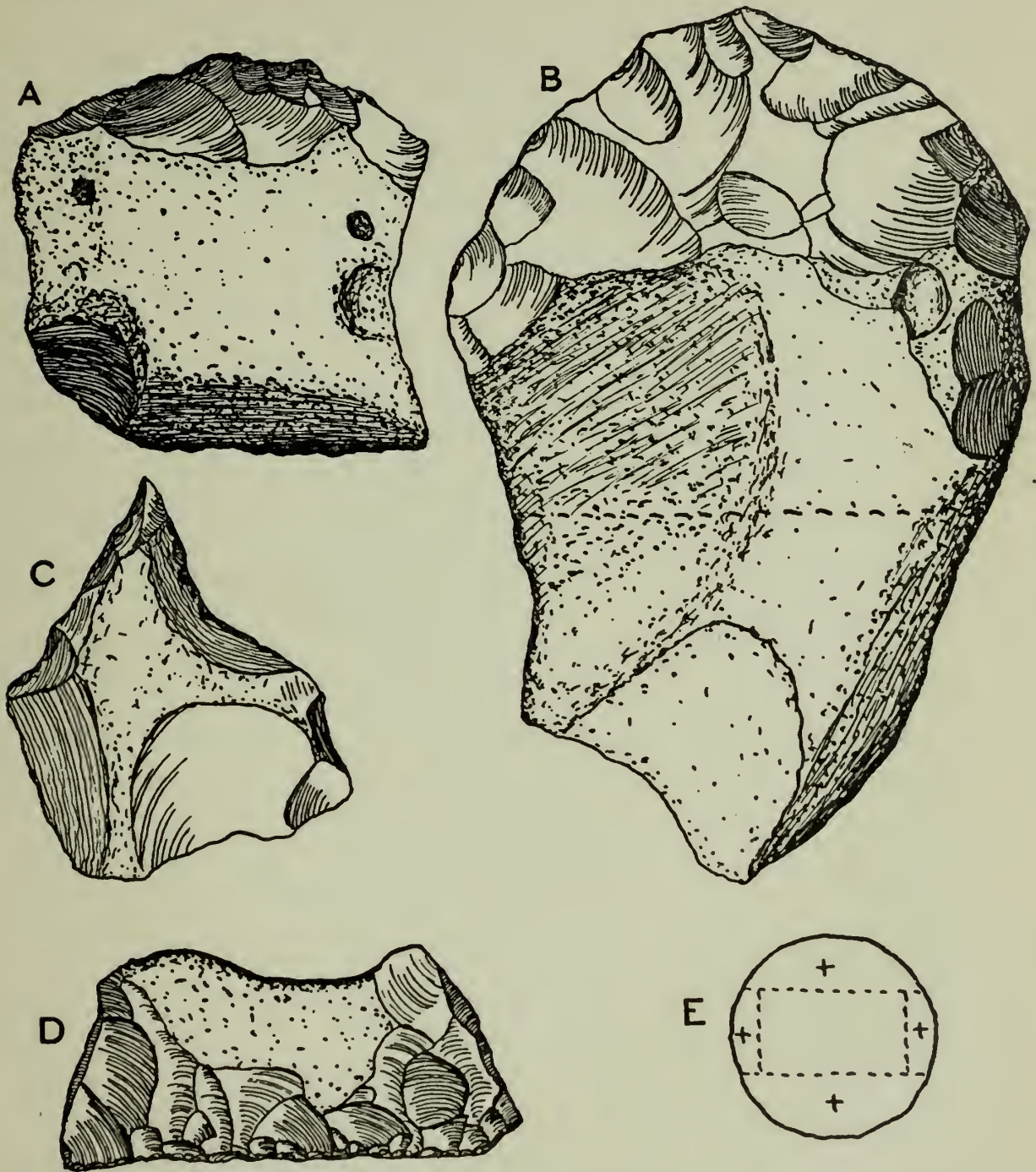


Fig. 38. Flint implements made by the author and used in experiments described. *A* and *D*, planes; *B*, axe, which was hafted along dotted line; *C*, point used for boring; *E*, section of branch from which specimen shown in Plate XII C was formed. The continuous and dotted lines enclosing crosses indicate the four pieces which were split off the original branch.

rounded surface was removed (Fig. 38 *E*), and the specimen thus caused to assume, approximately, a plank-like form, oblong in section. The wood was then further modified to the desired shape by means of the flat-based planes shown in Fig. 38 *A* and *D*, which were also used in smoothing down the

point of the stake illustrated in Plate XII *B*. As regards the method of formation of the planks found in the Lower Floor, I think that this involved the use of stone wedges driven into the trunk along the line of the desired cleavage. These wedges would no doubt be driven home with heavy hammer-stones, a process really very closely allied to that adopted by me in using the flint axe for splitting the wood.

The piece of deal (Plate XII *A*) was perforated by means of the pointed implement (Fig. 38 *C*), the operation being carried out from both sides of the wood alternately, while the specimen shown in Plate XII *D* represents a branch of an elm tree which was sawn through with a flint flake, the cutting edge of which I did not provide with "teeth" by notching. With the exception of the axe, which was mounted, all the other flint implements were held in the hand when in use. These simple experiments which I carried out have convinced me that the pieces of wood, forming the basal portion of the wind-shelter, could have been produced with flint implements, and that with suitably shaped flint artifacts, it is possible to do most things in the rough shaping of wood that can be done with steel tools. Further, it appears to me at present to be very difficult to distinguish in the majority of cases, between wood thus cut by flints, and that which has been roughly shaped by steel. In this regard I would draw attention to the cut (indicated by an arrow in Plate XII *B*) resulting from a blow with the flint axe. This incision is, however, so narrow and "clean" that I cannot see how it is possible to differentiate between it and a cut produced by a sharp steel hatchet. I found that the shaping of these pieces of wood, though not actually difficult, was nevertheless a very slow process, as may be judged from the fact that it took me about half an hour to perforate the piece of deal shown in Plate XII *A*. It would seem probable that prehistoric man, from the earliest times, utilised wood for making into implements and weapons, but it is only under exceptional geological conditions that any examples of this material would be preserved till the present day. The experiments which I carried out have demonstrated to me that very many of the ancient flint implements, referable to every phase of the Stone Age, which have been found, are admirably adapted for the shaping of wood and similar material, and I feel that these





SPECIMENS OF WOOD SHAPED WITH FLINT IMPLEMENTS

- A.* Piece of deal perforated by flint point
- B.* Branch of apple-tree pointed: note cut indicated by arrow
- C.* Apple wood shaped to a plank-like form from a more or less circular branch
- D.* Branch of elm sawn through with a flint flake





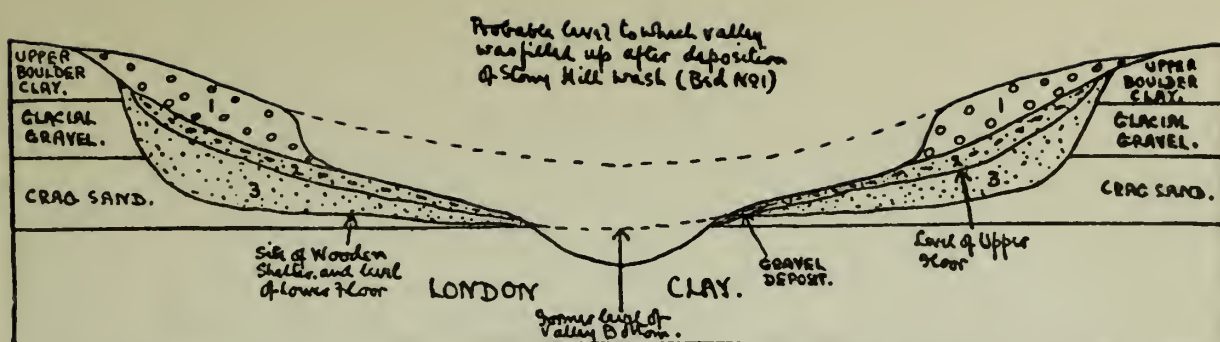


Fig. 39. Diagrammatic cross-section (not drawn to scale) of Messrs Bolton and Co.'s valley. The position of the wooden shelter and that of the Upper and Lower floors is indicated. (1) Stony Hill-wash, (2) greyish sand, with ferruginous concretions, (3) sand.

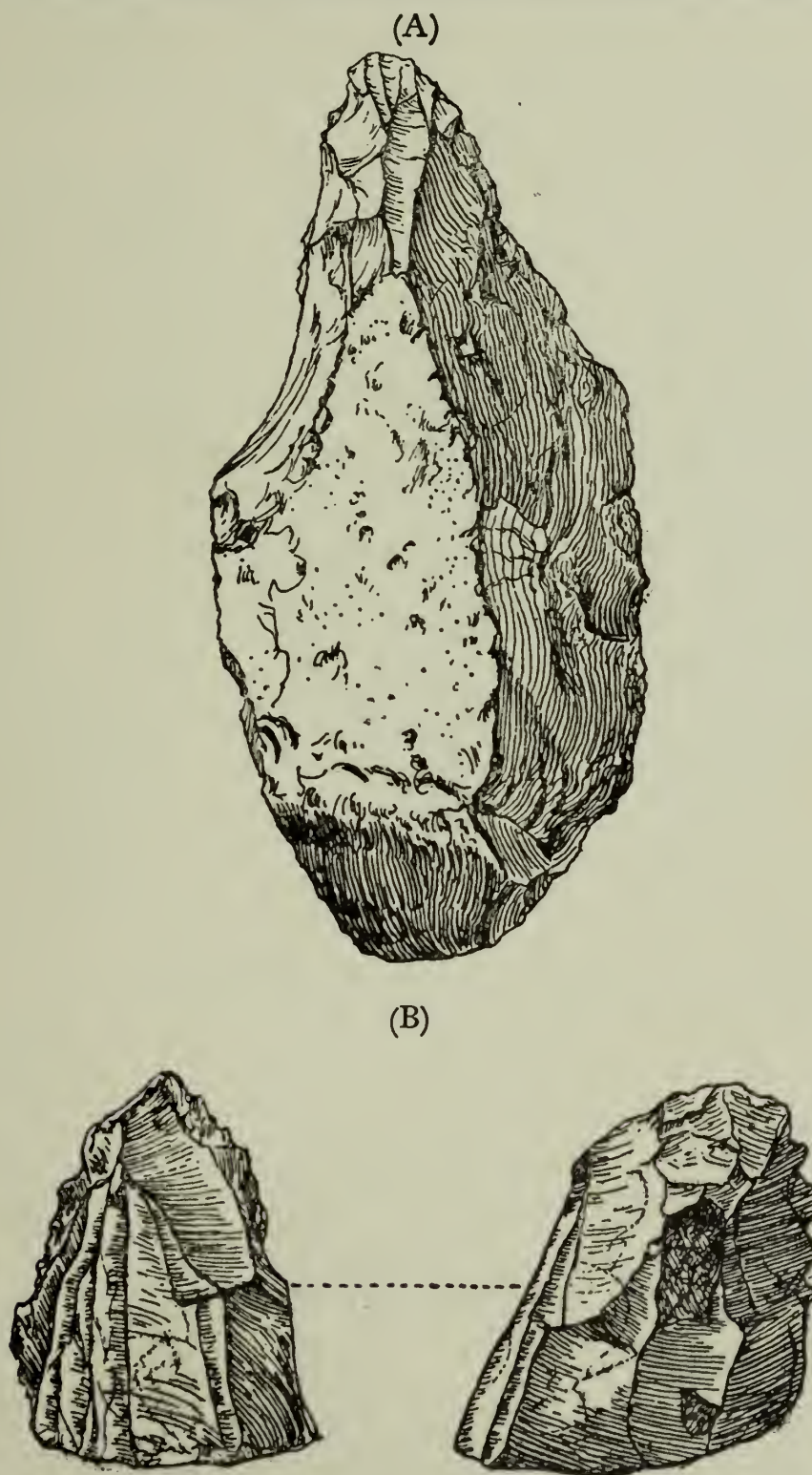


Fig. 40. Flint implements from the Upper Floor in Messrs Bolton and Co.'s brickfield, Ipswich. (A) nosed scraper, (b) core-scraper. (Nat. size.) R.A.I.

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practically indestructible flint implements represent, as it were, merely the "insoluble residue" of prehistoric industries, of which the other, and more easily destroyed artifacts, have disintegrated, and disappeared, during the great periods of time that have elapsed since they were made. If this surmise

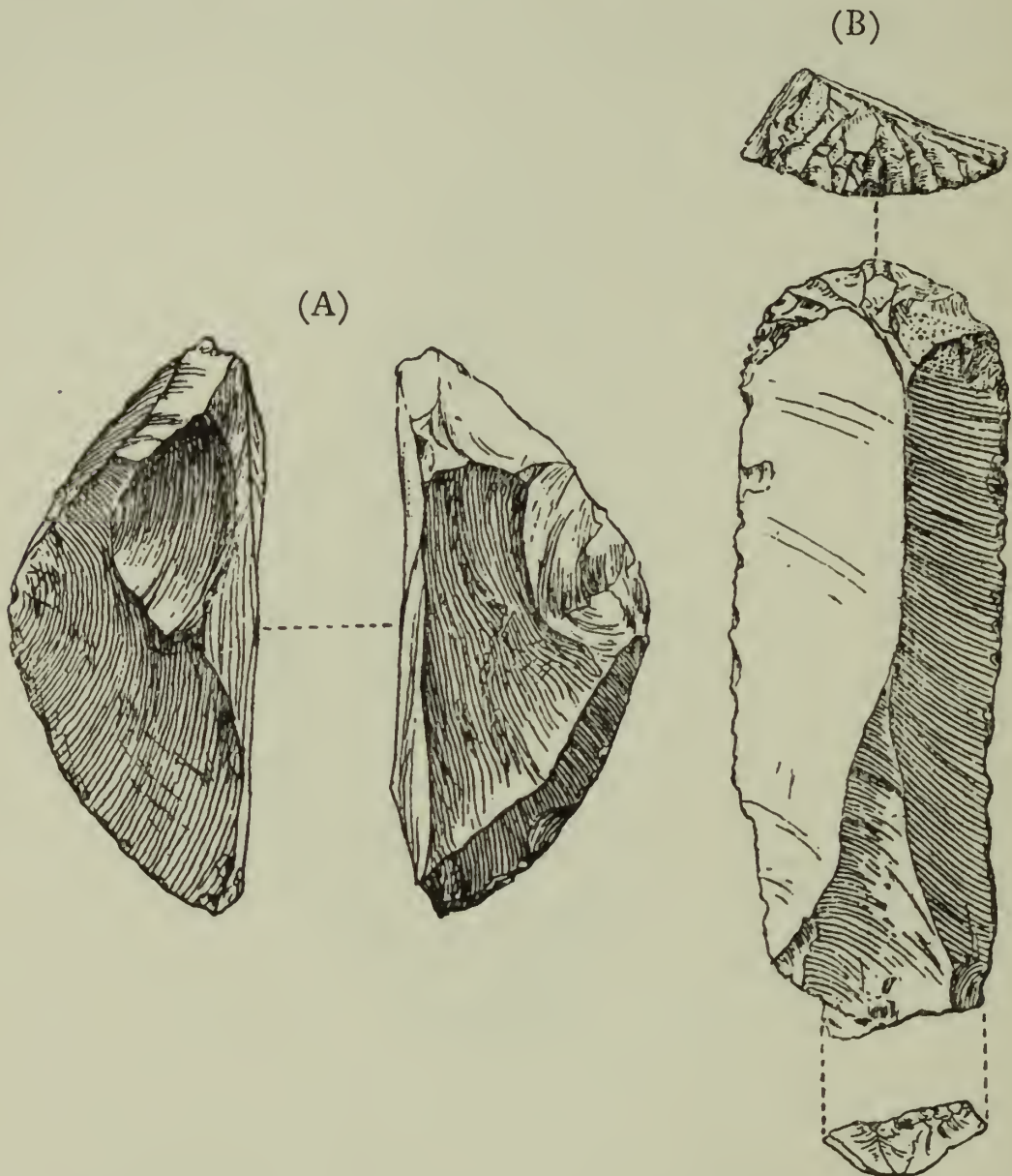


Fig. 41. Flint implements from the Upper Floor in Messrs Bolton and Co.'s brick-field, Ipswich. (A) *burin*, or graving tool, (B) blade scraper. (Nat. size.) R.A.I.

is correct, then the flint implements of ancient man may, after all, only give us a very limited and imperfect picture of his state of civilisation.

After the evacuation of the valley by the people inhabiting the Lower Floor, a layer of sand, in some places 5 feet thick (Fig. 39), was laid down over the old land surface. This sand contains no relics of man, and owes its origin to the slow



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crumbling away of the sandy slopes of the valley—under the influences of rain and wind—and their deposition at a lower level. This process no doubt occupied a considerable space of time, and while it was going on the valley was uninhabited by man. At the surface of this sand, however, is found in places another occupation-level containing flint implements which differ in form, and in colour from those of the Lower Floor,

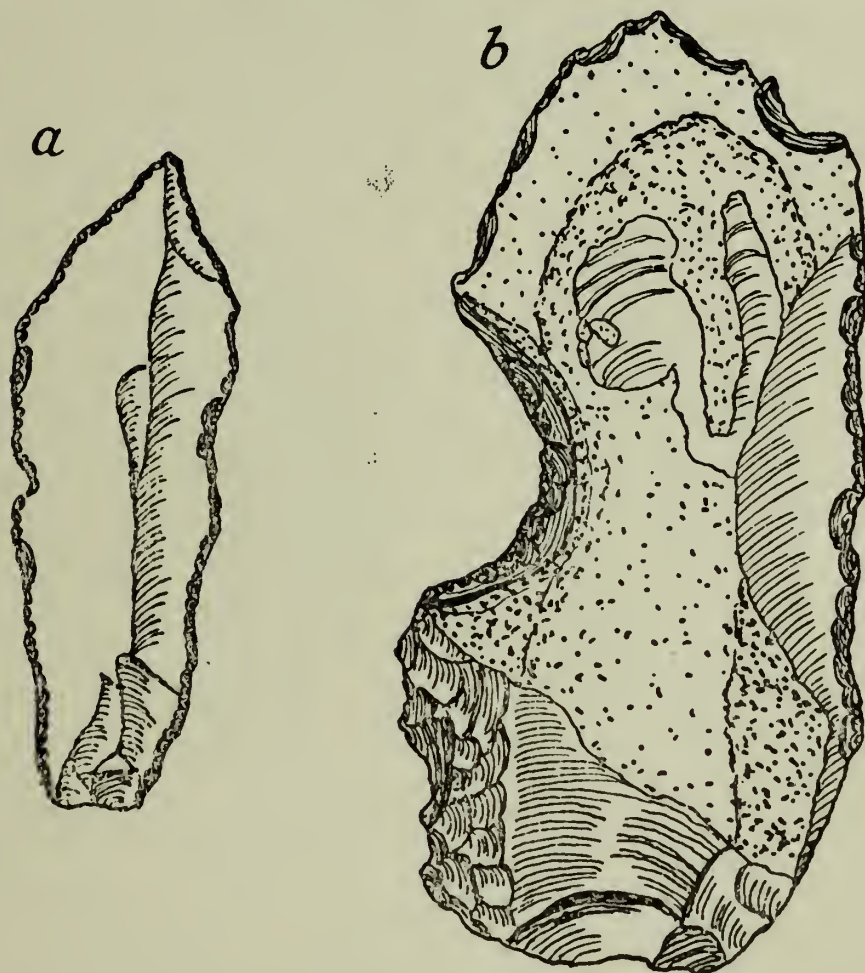


Fig. 42. Flint implements from the Upper Floor in Messrs Bolton and Co.'s brickfield, Ipswich. (a) point, (b) notched flake. (Nat. size.)

and in Professor Commont's view are referable to a phase of the Aurignacian, Upper Palaeolithic, epoch.<sup>1</sup> The specimens comprise elongated planes, with a rounded "nose" for scraping purposes (Fig. 40), core-scrapers of a conical form (Fig. 40), scrapers made on long blades of flint (Fig. 41), flakes with notches in their sides (Fig. 42), points (Fig. 42), and graving tools of various kinds (Figs. 41, 43 and 44).

The general facies of the implements of the Upper Floor is more delicate than that of those from the lower level—and it is

<sup>1</sup> Moir, J. Reid, *Journ. Roy. Anthr. Inst.* vol. XLVII, 1917, pp. 367-412.

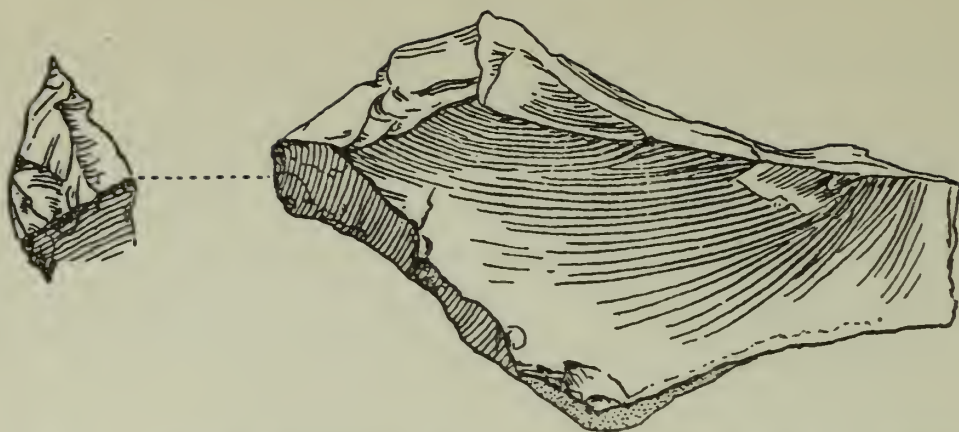


Fig. 43. *Burin*, or graving tool, from the Upper Floor in Messrs Bolton and Co.'s brickfield, Ipswich. (Nat. size.) *R.A.I.*

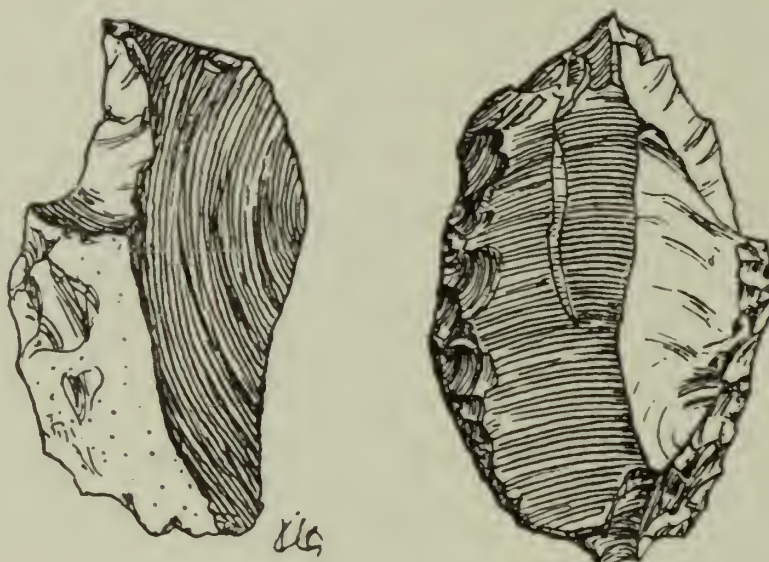


Fig. 44. *Burins*, or graving tools, from the Upper Floor in Messrs Bolton and Co.'s brickfield, Ipswich. (Nat. size.) *P.S.E.A.*



clear that a different technique in flint-flaking was being employed. No bones, wood, or pottery, have been found in the Upper Floor, and we have thus only the flint implements preserved to tell us anything about the people of this period in Suffolk. The presence, however, of gravers among the flint artifacts, points to the fact that these East Anglians were probably following the usual Aurignacian practice of engraving outlines of animals, and other objects, upon bone, but, if so, none of these works of art have been preserved in the deposits of the Ipswich valley. We do not know for how long the Upper Floor was occupied by man, but it is clear that this occupation was eventually brought to a close, and a layer, several feet in thickness, of greyish sand, containing peculiar ferruginous concretions, deposited over the ancient surface. This deposit again may be regarded as a form of very fine hill-wash, and, while it was being laid down, human beings were not present in the valley. There is little or no sign of a floor upon the surface of the greyish sand, but, in the stony hill-wash, averaging 8 feet in thickness, covering the sand have been found two beautiful flint implements (Fig. 45) that appear to be referable to the earlier part of the Solutrean period, which succeeded the Aurignacian. After the deposition of this hill-wash, which was laid down during an epoch of low temperature when alternate freezing and thawing of the surface soil caused it to slide, in the form of a sludge, down the sides of valleys, the valley was deepened by water-action (Fig. 39), and assumed its present appearance.

It will be realised by an examination of Fig. 39 that this hill-wash is present as a terrace on either side of the valley. Now, it is obvious that if no changes had occurred in the valley since the hill-wash was laid down this deposit would naturally be thickest on the valley floor. But such is not the case. The hill-wash is present merely as a terrace (where it attains a thickness of 8 feet) on either side of the valley, and the conclusion must be that this deposit, at one time, filled up the entire width of the valley from side to side (as indicated by the dotted line in Fig. 39). Subsequently, water flowing from the plateau to the east, swept out the hill-wash material in the valley, and produced the terraces as we now see them. Changes of this kind involving the deposition of great thickness of

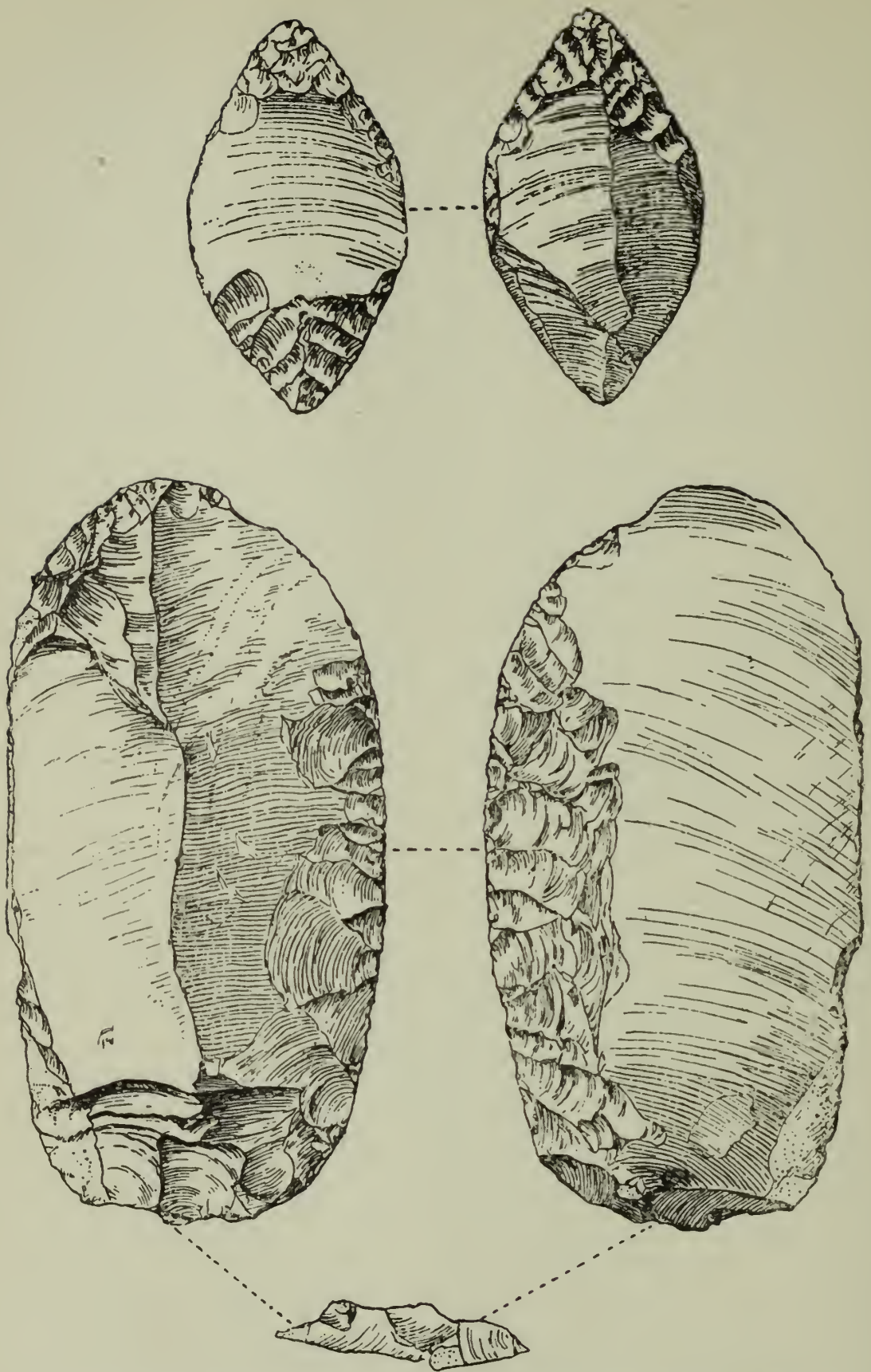


Fig. 45. Early Solutrean blades from Stony Hill-wash in Messrs Bolton and Co.'s brickfield, Ipswich. (Nat. size.) *R.A.I.*



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sludge, and the presence of much water in what are now dry valleys, must be associated, inevitably, with glacial conditions, and I have little doubt that the phenomena described above were caused during the final stages of the Fourth Glacial period of East Anglia. From levels I have taken it appears that the lowest point in the valley floor is situated 88 yards from the foot of the terrace, which lies at a height of about 25 feet above the valley floor. The terrace itself averages 13 feet in height, which it attains in a distance of about 14 feet, and presents an abrupt slope. Similar terraces at about the same height are to be seen in numerous tributary valleys in Suffolk, and were probably produced by the widespread conditions operating in Bolton and Co.'s valley at Ipswich. These geological conclusions are supported by several well-known and competent geologists who have made a careful study of the brickfield under consideration.

In the surface soil of the valley have been found well-made arrow-heads, a Campigny axe of the Early Neolithic period, and pieces of polished axes in flint, showing that men of the New Stone Age also lived in the area (Fig. 46). It is probable that the archaeological richness of this small valley at Ipswich is unique, but, on the other hand, it must not be forgotten that the extensive diggings for the extraction of the London Clay, and the numerous archaeological excavations that have been undertaken, have afforded altogether exceptional opportunities for seeing what the various strata exposed contained. Similar examination in other like valleys in East Anglia would, in all likelihood, produce comparable results, and that this view is, probably, correct is supported by the fact that in the Broom Hill valley, immediately to the south of that described in this chapter, recent excavations by the Ipswich Corporation have shown that both geologically and archaeologically the two valleys have gone through similar changes, and supported the same prehistoric civilisation. A series of implements found by me in blackish sand at a depth of 3 feet from the surface on the side of a small valley at Greenwich Farm, Ipswich, represent, in all probability, the same culture present in the Lower Floor in Messrs Bolton and Co.'s brickfield.<sup>1</sup> It is evident that the makers of the flint implements found in these valleys did not

<sup>1</sup> Moir, J. Reid, *Proc. P.S.E.A.* vol. III, pt 3, p. 390.

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sink mines for their raw material, as was done in some parts of the country, as the floor specimens are made, almost exclusively, from flints derived from either the Glacial Gravel, or the Boulder Clay, which form the surface soil on the high ground. In pre-historic times, as at present, stones from either of these deposits could be picked up in quantity.

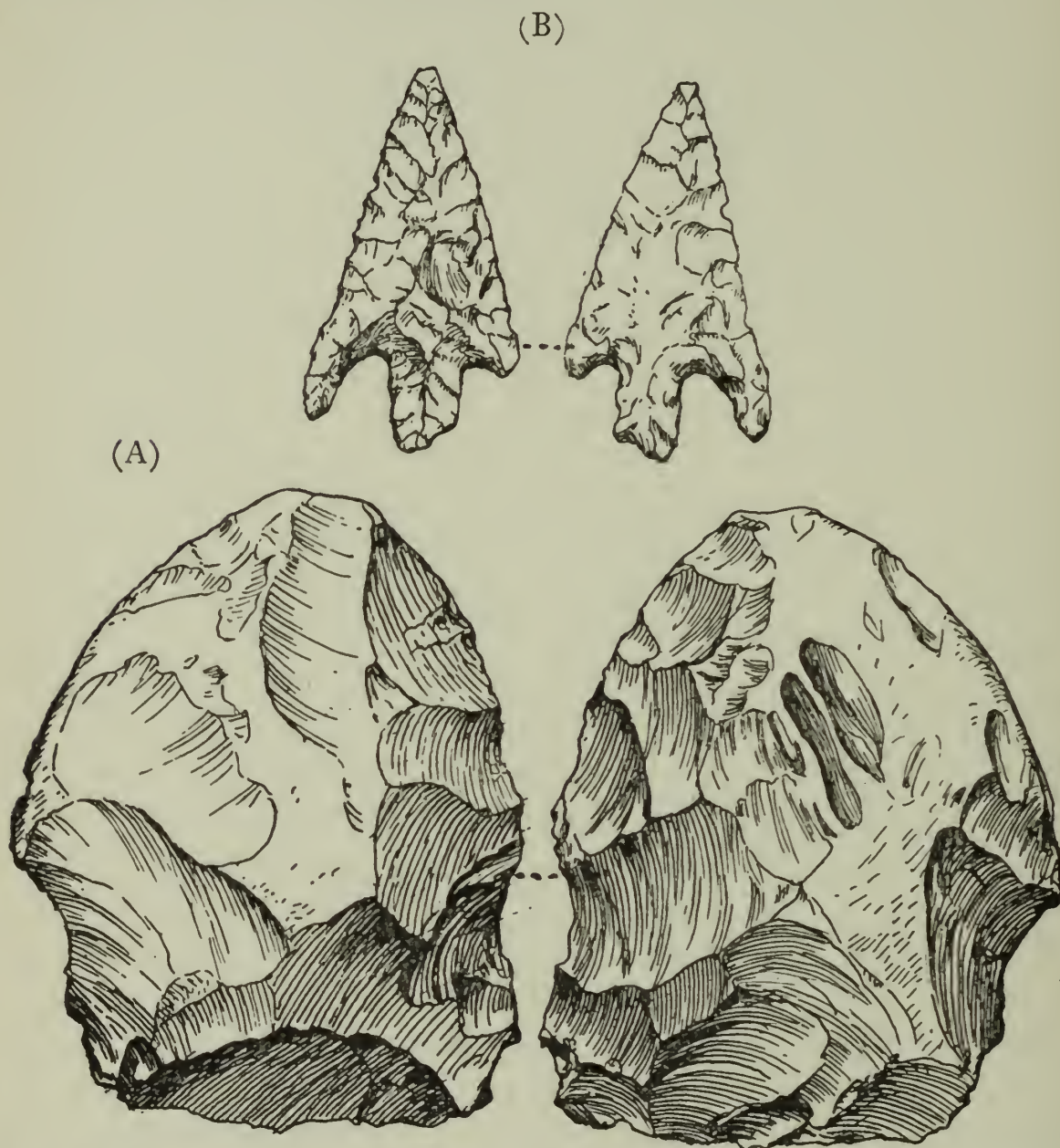


Fig. 46. Flint implements from the surface soil in Messrs Bolton and Co.'s brickfield, Ipswich. (A) portion of polished axe reflaked, (B) arrow-head. (Nat. size.) *P.S.E.A.*

The geological age of the floors and associated deposits in Messrs Bolton and Co.'s brickfield at Ipswich is clearly intermediate between the time of the deposition of the Boulder Clay of the Third Glacial period, and the laying down of the stony hill-wash which seals in the implement-bearing beds. As has been shown, when this hill-wash was laid down, East Anglia



was experiencing a cold climate, and the disappearance of these climatic conditions was accompanied by the final deepening of the valley, and the formation of a small escarpment on either side of it, by water action. Now, as this valley is tributary to the main drainage channel of the River Gipping, and as the conditions described were operating without doubt in all the numerous other tributary valleys, it is certain that the Gipping valley must have been also affected. It would, in fact, be expected that the large volumes of water poured into this valley from its tributaries would result in the laying down of gravel of considerable thickness, and this is what apparently did indeed occur. At the bottom of the Gipping valley there is present an extensive sheet of gravel of about 8 feet in thickness, and at the base of this deposit, exposed some years ago at the site of the Electric Power Station, Constantine Road, Ipswich, have been found some remarkable Solutrean implements. It will be remembered that two specimens referable to the Solutrean period were found in the stony hill-wash above the Upper Floor in the valley where I have conducted excavations, and it is possible thus to say that this hill-wash and the gravel in the bottom of the Gipping valley are, in all probability, of the same age, and it is clear that the conditions giving rise to the deposition of a hill-wash on the high ground, would be very likely to result also in the laying down of a gravel bed in the main valley. The Neolithic implements are found in the surface soil above the stony hill-wash in the tributary valley, and in the main valley I found, in excavations made in the Ipswich Recreation Ground, adjacent to the Electric Power Station, an occupation-level of this period, containing many flaked flints, together with an Early Neolithic axe and a bone implement partly ground, below 2 to 3 feet of peat (Figs. 71, 72, 73). This floor rested upon the surface of the gravel from beneath which the Solutrean implements were derived, and it is thus evident that since the Neolithic period of East Anglia, no geological changes of any magnitude have occurred in this area, and that, on the other hand, the Solutrean epoch, and the more ancient floors in Messrs Bolton and Co.'s valley, are separated from the Neolithic by a considerable period of time during which a number of marked geological changes have taken place accompanied by a definite climatic oscillation. It

is probable that the mammalian remains found in brickearth by the well-known archaeologist Miss Nina Layard, F.S.A., on the south side of the Ipswich tunnel, on the L.N.E.R.,<sup>1</sup> is of a very similar age to the Lower Floor in Messrs Bolton and Co.'s brickfield. The excavations in the brickearth, which were conducted by Miss Layard with much care and success, revealed a definite "tortoise-core" in flint, a typical artifact of the Mousterian period. The fossiliferous deposits there were covered by some thickness of gravel and rested upon what appeared to be Upper Chalky Boulder Clay, and contained bones and teeth of the mammoth, cave lion, red deer, wolf or dog, cave bear, and *Bos primigenius*, associated with the remains of the fresh-water tortoise, and mollusca.

Mr Bellerby Lowerison has published an account of a discovery made by him during the digging of an artificial lake in Heacham Park, Norfolk,<sup>2</sup> where a floor of, apparently, Aurignacian age occurred under the following series of deposits, given in descending order:

- (1) Brown peaty earth 7 to 8 inches.
- (2) Grey marly earth or clay 2 inches.
- (3) White chalky clay, with *Paludina* and other fresh-water shells, 8 inches.
- (4) Black band composed of decayed vegetable matter, 3 inches.
- (5) White chalky deposit, with *Paludina* and other fresh-water shells, 11 inches.
- (6) Aurignacian floor resting upon sand.

An epoch-making discovery that has altered our whole conception of the advancement and state of civilisation of Aurignacian man, has been made, recently, by Professor Absolon of Brünn in Czecho-Slovakia.<sup>3</sup> In this part of Europe there exist thick and widespread deposits of loess—a wind-borne material laid down during the glacial period. For many years past, remains of early man have been found in this bed, and it is clear that, at Predmost, a small village in Czecho-Slovakia, there existed, at the foot of a limestone cliff, in the remote past, a camping ground of Aurignacian man. The old land surface is now buried deeply beneath the loess which, at this spot, attains a thickness of 65 feet, but, thanks to the excavations carried out in a brickfield, and to the keenness and

<sup>1</sup> Layard, N. F., *Proc. P.S.E.A.* vol. III, pt 2, pp. 210–219.

<sup>2</sup> Lowerison, B., *Proc. P.S.E.A.* vol. I, pt 4, p. 475.

<sup>3</sup> *Illustrated London News*, October 31st, 1925, November 7th, 1925, November 14th, 1925, and November 21st, 1925.



acumen of Professor Absolon and his colleagues, this ancient camping ground is now being carefully examined, and has already yielded a large number of highly important prehistoric relics. To begin with, there has been found what is described as a family tomb where no less than twenty human skeletons were buried. The bones lay in a large heap 13 feet long by  $7\frac{1}{2}$  feet wide surrounded by palisades of the shoulder, and jaw-bones, of the mammoth, and covered with a layer of stones as a protection against wolves and hyaenas. Sir Arthur Keith, who has made a study of these skeletons, is of the opinion that they represent a type of human being closely akin to those now living in Europe. They had regular and well-formed features, and long skulls, while their stature was, in the case of males, above the normal. With the remains of these ancient people of modern type were found a unique series of cultural objects—the discovery of which constitutes nothing less than an archaeological revelation. These people of late glacial times fashioned spades and forks from mammoth bone, horn “buckles” for fastening their clothes, daggers formed from the small bones of the leg of lions, needles of reindeer horn, assegais, and daggers, used in hunting. What is still more remarkable is the discovery of perforated ribs of the mammoth, and, inserted in the perforation, pieces of polished bone shaped like Neolithic axes, and discs of stone of circular form and perforated in the centre which are similar to the mace-heads of Neolithic times. Never before has evidence come to hand that such specimens as this were in use before the latter epoch, and their discovery is of much importance to archaeologists. There have also been discovered at Predmost human figurines in clay, and models of the mammoth in ivory, together with many other relics too numerous to mention. The flint implements found are of Late Aurignacian types, but these were evidently but the tools with which the other specimens in bone and ivory were made, and which by a very fortunate series of geological circumstances have been preserved for examination by modern archaeologists.

## CHAPTER IX

### *Late Palaeolithic Man in East Anglia*

IN the earlier portion of Aurignacian times, the flint implements in use, though showing very skilfully produced, narrow, "channel" flaking, tend, nevertheless, to be somewhat thick and squat. Towards the close of this epoch, however, the implemental types became longer and narrower, and it is evident that the use of elongated blades of flint made into scrapers, knives and graving tools, was coming into vogue. In 1914 my attention was drawn to the discovery of a number of flint implements and flakes that had been found while sinking an inspection-pit for a motor garage in a garden in Ivry Street, situated on the high ground in the northern part of Ipswich.<sup>1</sup> The owner of the property very kindly gave permission for an investigation of this site, and a number of interesting discoveries were made. The diggings carried out exposed a section composed of 1 foot of surface soil, and 2 feet of fine, stoneless, sand, while immediately below this occurred numerous flint cores, flakes, and implements, associated with quartzite hammerstones and burnt flints. Thus, it is evident that an ancient land surface existed at this spot, and by the type of artifacts recovered, it appears to have been occupied towards the close of Aurignacian times. The humanly-struck flints are all long and narrow, and were removed from flints of considerable size that had been brought to the site for the purpose, as no raw material of this kind exists in any of the beds forming the plateau in the Ipswich district. The most outstanding type of the Ivry Street implements are the *burins*, or graving tools, some of which (Fig. 47) correspond very closely with others found by Commont at Belloy-sur-Somme in France.<sup>2</sup>

The Ivry Street area is very sandy, and the fine material overlying the ancient floor was probably laid down during dust storms, which accompanied the high winds so prevalent in Upper Palaeolithic times. The artifacts discovered, though found at a place situated only about one mile to the south of

<sup>1</sup> Moir, J. Reid, *Proc. P.S.E.A.* vol. II, pt 4, pp. 475-479.

<sup>2</sup> Commont, V., *Les Hommes contemporains du Renue*, p. 338.



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Messrs Bolton and Co.'s brickfield, differ entirely from the contents of the floors there exposed, and are apparently of slightly later date. Professor J. E. Marr has figured and described a *burin* found by Mr Frank Barclay of Cromer upon the surface at Higham, Suffolk, that resembles very closely those found at the Ivry Street site, and is probably of the same age.<sup>1</sup> After the Aurignacian period had closed Europe was inhabited by a race of people who made some of the most beautiful flint implements known to archaeologists. These were the Solutreans, a name derived from the famous prehistoric "station" of Solutré (*Saône et Loire*) in France, where, at the foot of a precipitous cliff facing south, large numbers of the relics of this race have been found. The Solutreans were tall and well-made people with long skulls, and the wonderful straight and thin blades of flint flaked, on both sides, into the form of a laurel leaf, which they made and used, no doubt as spear-heads, represent the high-water mark of excellence in flint flaking in Palaeolithic times. In fact, except for the flint knives, of exquisite workmanship, referable to the Early Dynastic period of Egypt, the Solutrean technique on flint has never been equalled. Though, quite recently, a discovery has been made, by M. Peyrony in a Solutrean layer at Les Eyzies, in southern France, of a slab of limestone bearing a carving, in high relief, of two oxen, yet extensive examination of the deposits of this period have failed to reveal any artistic capabilities (which were such a marked feature of the people of Aurignacian times) on the part of the Solutreans. It seems, indeed, that all their skill was put into the making of

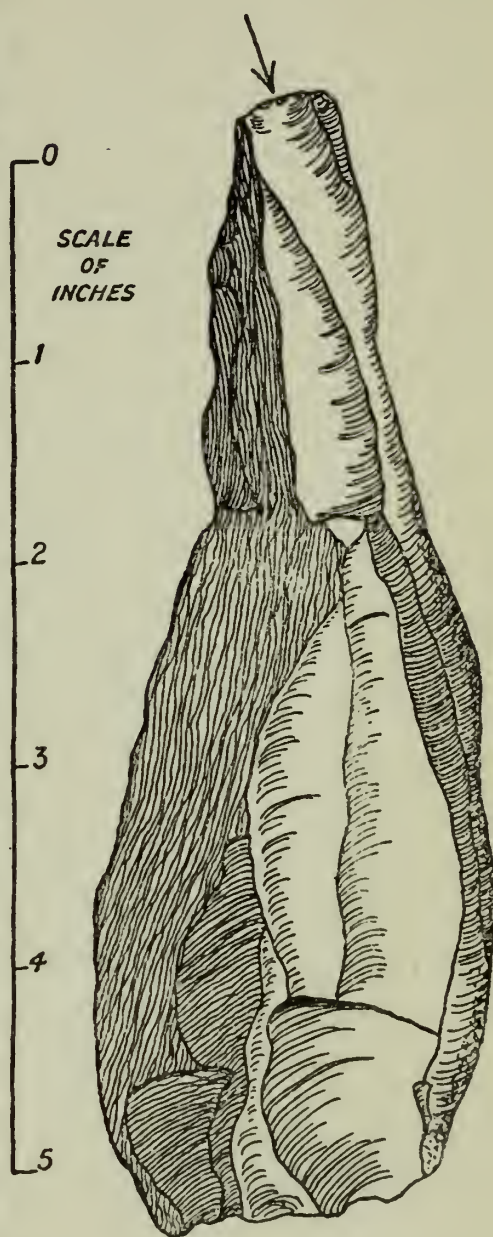


Fig. 47. Large *burin*, or graving tool, from Ivry Street, Ipswich.

<sup>1</sup> Marr, J. E., *Proc. P.S.E.A.* vol. IV, pt 2, pp. 163-164.



symmetrical and beautiful flint implements which even to-day excite the wonder and admiration of all those who examine them.

Some of the finest Acheulean hand-axes, the longer edges of which are more or less straight, and the pointed end of a blade-like thinness seem to, as it were, foreshadow the later Solutrean masterpieces, and it has been suggested that the genesis of this latter culture must be looked for in Acheulean times. The finest Solutrean implements known are those which were found at a place called Volgu (*Saône-et-Loire*, France) in 1874.<sup>1</sup> There, at a depth of about 4 feet from the surface of the ground, in a sandy soil exposed upon the side of a river valley, a workman uncovered no less than twelve Solutrean blades standing up side by side in the old land surface, where they had been left by their maker. The specimens are all made in honey-coloured flint, and their great size, and beauty of workmanship, are remarkable. The longest of these famous blades measures  $13\frac{7}{8}$  inches in greatest length, just under  $3\frac{1}{2}$  inches in greatest width, and slightly less than  $\frac{1}{3}$  of an inch in greatest thickness. The Solutrean implements are made from flakes, and to be able to detach slices of flint well over a foot in length necessitated a very large nodule upon which to operate. To remove any flake of this length requires very great skill, but when it is realised that the longer edges of the Solutrean blades are almost straight, we realise that these long flakes were removed in such a way that the line of fracture caused by the blow followed an approximately straight course to the point of its emergence from the parent block of flint. To accomplish this requires great control over the raw material, and I think it probable, that (and in this opinion I have the support of Professor Henri Breuil) the nodule of flint was bound tightly with hide or bark, which procedure, as is known, has the effect of preventing (for some unknown reason) the line of fracture, caused by a blow with a hammer-stone, from emerging, prematurely, from the block of flint operated upon. When the desired long, straight, flake was produced, it was thinned down by the elaborate surface-flaking seen upon Solutrean blades, and while some have supposed that this flaking was accomplished by pressure applied with another stone, or a bone point,

<sup>1</sup> *Les Silex de Volgu*, Chalon-sur-Saône, 1874.



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I lean to the opinion that it was produced most frequently by means of blows delivered by skilfully wielded, and small, hammer-stones.

It is also my opinion that, for the reasons now to be related, Solutrean man lived in East Anglia, and made there his remarkable and typical blades. Mention has already been made of the Early Solutrean implements found in the hill-wash

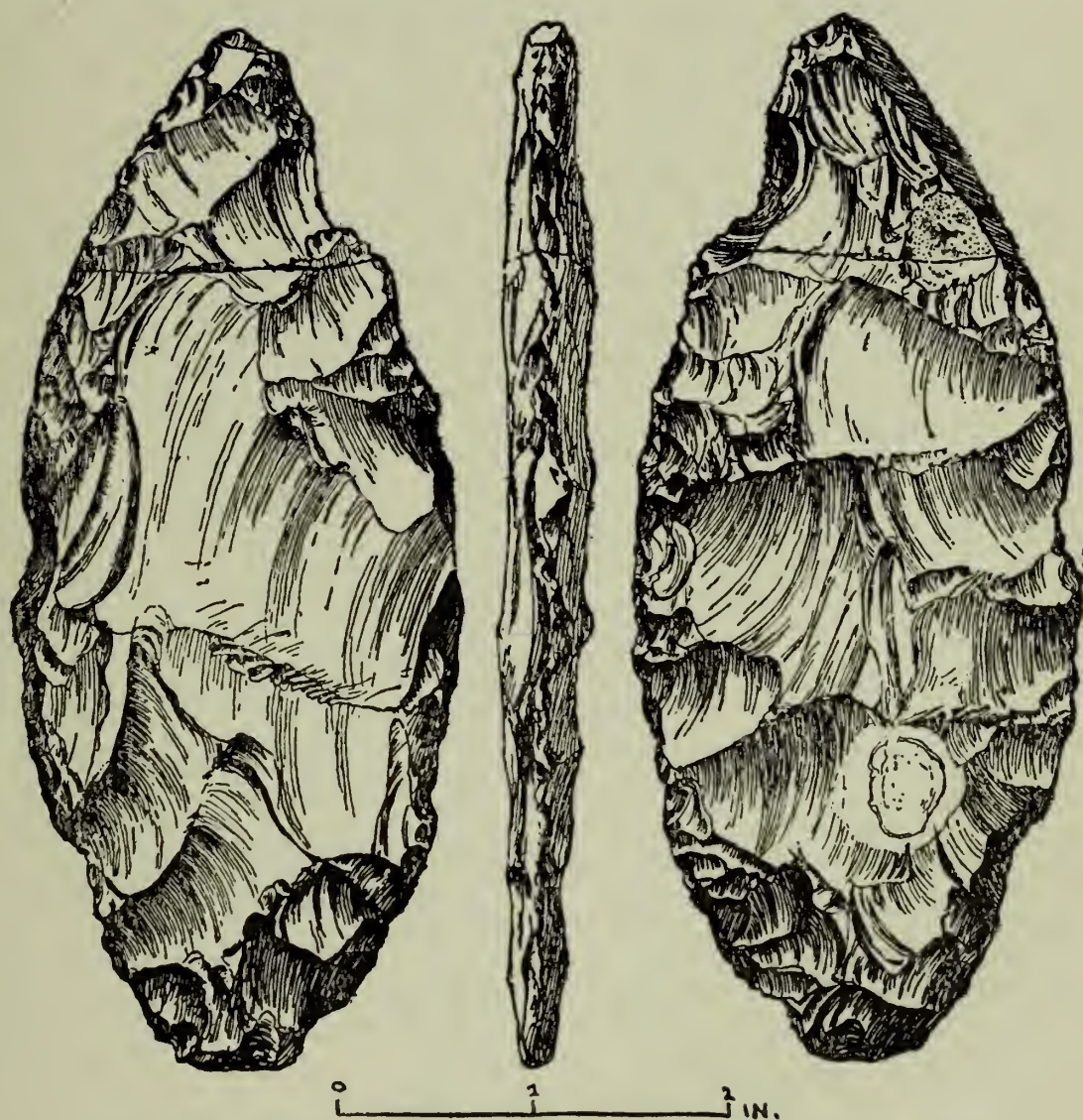


Fig. 48. Solutrean blade found at Southwold, Suffolk. *A. J.*

above the Aurignacian floor in Messrs Bolton and Co.'s brickfield (Fig. 40) and these specimens find a counterpart in a beautiful blade of the same type picked up on the surface of a field at Nacton to the east of Ipswich. Another notable find of a Solutrean blade was made by Mrs Edgar Turner who found it lying at the foot of a low cliff at Southwold on the Suffolk coast (Fig. 48) while another splendid example, of a dark chocolate colour, streaked with yellow, was dug up in making a land drain at Charsfield, Suffolk, many years ago (Fig. 49). A small



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and unique specimen was said to have been dug out of the brickearth at Hoxne brickfield, Suffolk (Fig. 49), associated

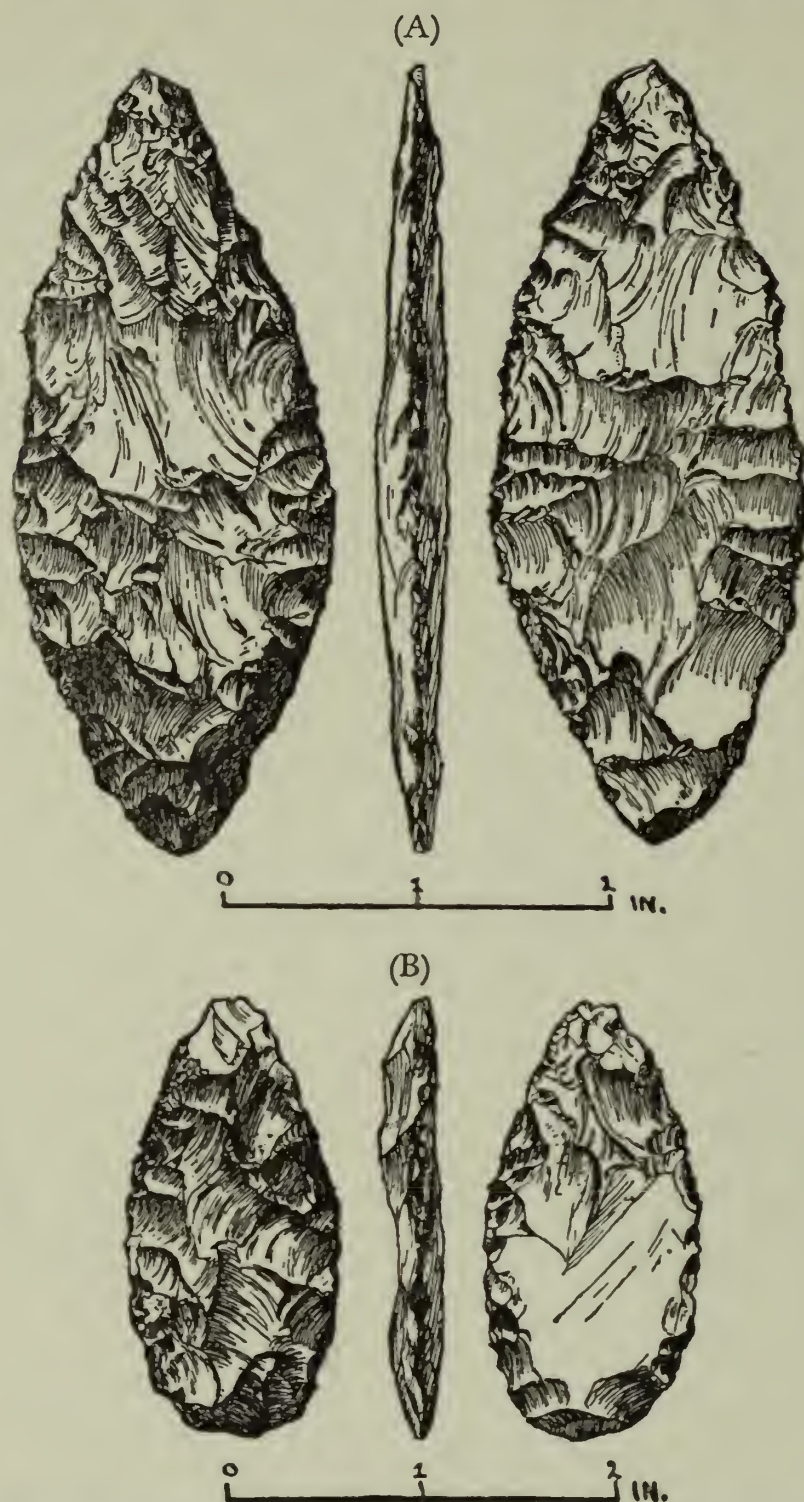


Fig. 49. Solutrean blades found in Suffolk. (a) Charsfield, (b) Hoxne. *A. J.*

with definite Acheulean hand-axes.<sup>1</sup> If the account of where this specimen was found is correct, it demonstrates that blades approximating to the Solutrean type were being made in Acheulean times, an important fact in tracing the origin of

<sup>1</sup> Moir, J. Reid, *The Antiquaries' Journal*, vol. II, No. 2, pp. 114-117.



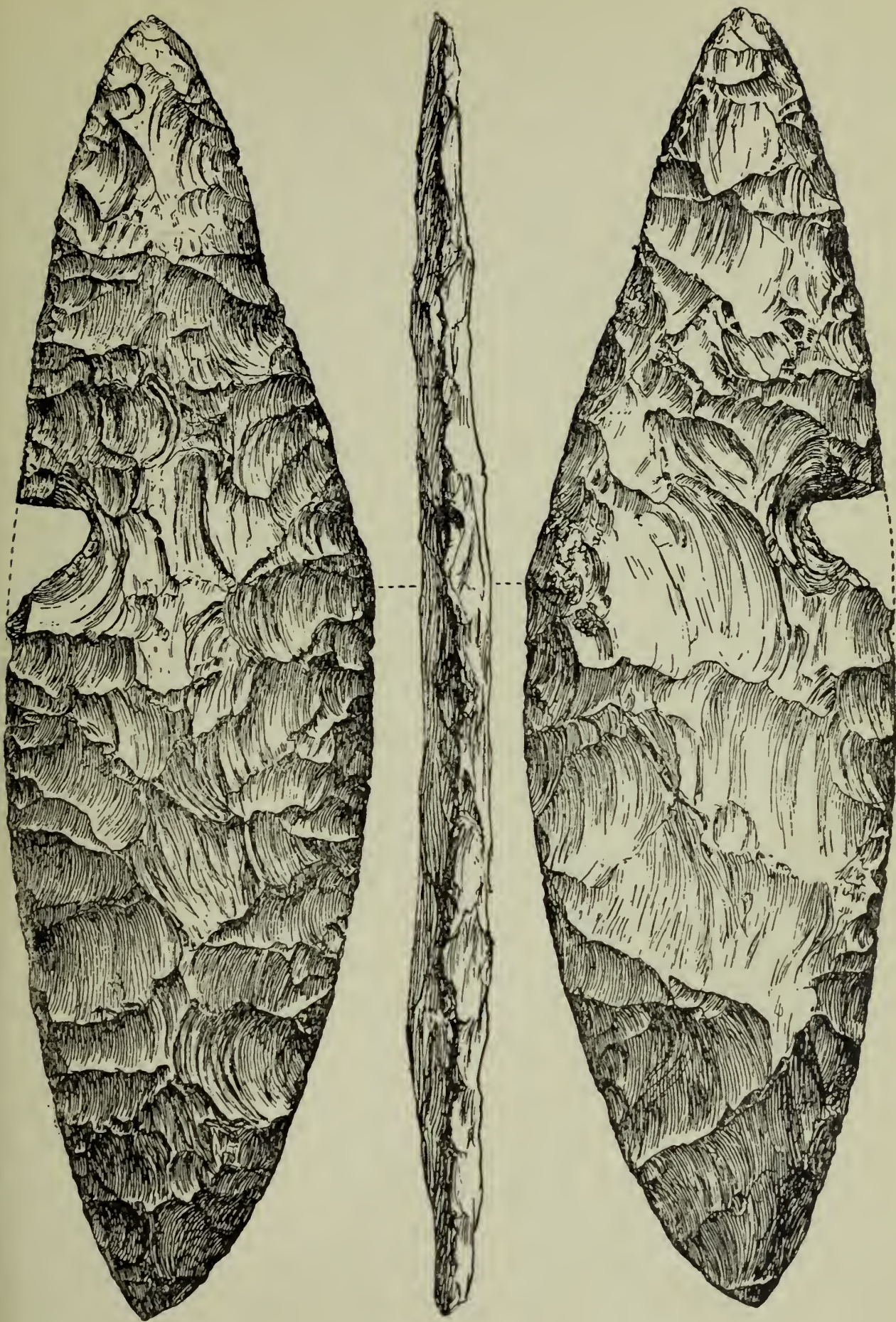


Fig. 50. Solutrean blade found below gravel at Constantine Road, Ipswich. (Slightly reduced.) *P.S.E.A.*



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these implements. The late Dr W. Allen Sturge also figured and described two specimens found, apparently upon the surface of the ground, at Cross Bank in Mildenhall Fen, Suffolk, and



Fig. 51. Solutrean blade found below gravel at Constantine Road, Ipswich. (Slightly reduced.)

in the neighbourhood of Shrub Hill, in south-west Norfolk,<sup>1</sup> while the late Mr W. G. Clarke found a portion of a Solutrean blade which had been derived from brickearth at Barnham in Suffolk.<sup>2</sup> But the most striking and beautiful blades of the Solutrean period were found deep in gravel in the bottom of the

<sup>1</sup> Sturge, W. A., *Proc. P.S.E.A.* vol. I, pt 2, pp. 229-232.

<sup>2</sup> Clarke, W. G., *Proc. P.S.E.A.* vol. I, pt 3, pp. 302-303.



Gipping valley at Ipswich.<sup>1</sup> These specimens have already been alluded to, and are of much importance as being found in a geological deposit about which a good deal is known. The blades, three in number (two of which are figured) (Figs. 50 and 51), were discovered by the workmen engaged in making the excavations for the chimney shaft at the Electric Power Station, Constantine Road, and there is little doubt that the specimens lay at the base of the valley gravel present at this spot. This gravel extends for miles up the valley of the Gipping, and was laid down after the last period of low temperature experienced in East Anglia. I closely examined the deposit when it was exposed in the Ipswich Corporation diggings carried out years ago at Hadleigh Road, and found in it many highly-rolled Chellean and Acheulean hand-axes, together with a series of long and narrow flakes, some of which may well be of Solutrean age. The blades found at the Electric Power Station are beautifully made, and quite typical of the Solutrean period. From the unabraded condition of these specimens it is evident that they have not moved far, if at all, from the place where they were made and we may conclude, therefore, that Solutrean man was living in the Gipping valley, when the land stood somewhat higher above sea-level than it does to-day. Another splendid example of Solutrean workmanship was found at Bury St Edmunds (Fig. 52), low down in the valley of the River Lark, under 9 feet of gravel, a very similar position to that in which the Ipswich blades were discovered. The Bury example is quite unabraded and evidently came from an old land surface now buried deep beneath river-gravel. The Ipswich and Bury St Edmunds blades are now in the possession of Mr W. Wells, of South Benfleet, Essex. Though the examples enumerated above do not represent by any means all of the Solutrean blades found in East Anglia, yet enough have been mentioned to show that the race of people making these implements had penetrated into Suffolk and Norfolk in Upper Palaeolithic times. In the later Neolithic period, and in the succeeding Bronze Age, spear-heads similar to those of the Solutreans were, occasionally, made. But the flaking of these more recent examples is generally

<sup>1</sup> Hancox, E. R., *Proc. Suff. Inst. Arch. and Nat. Hist.* vol. XI, pt 1 and pt 2, Fig. 4. Moir, J. Reid, *Proc. P.S.E.A.* vol. IV, pt 1, pp. 71-81.



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of a different order from that of the earlier, and cannot well be confused with it. Further, in the case of the blades found at the Electric Power Station, Ipswich, it has been shown that,

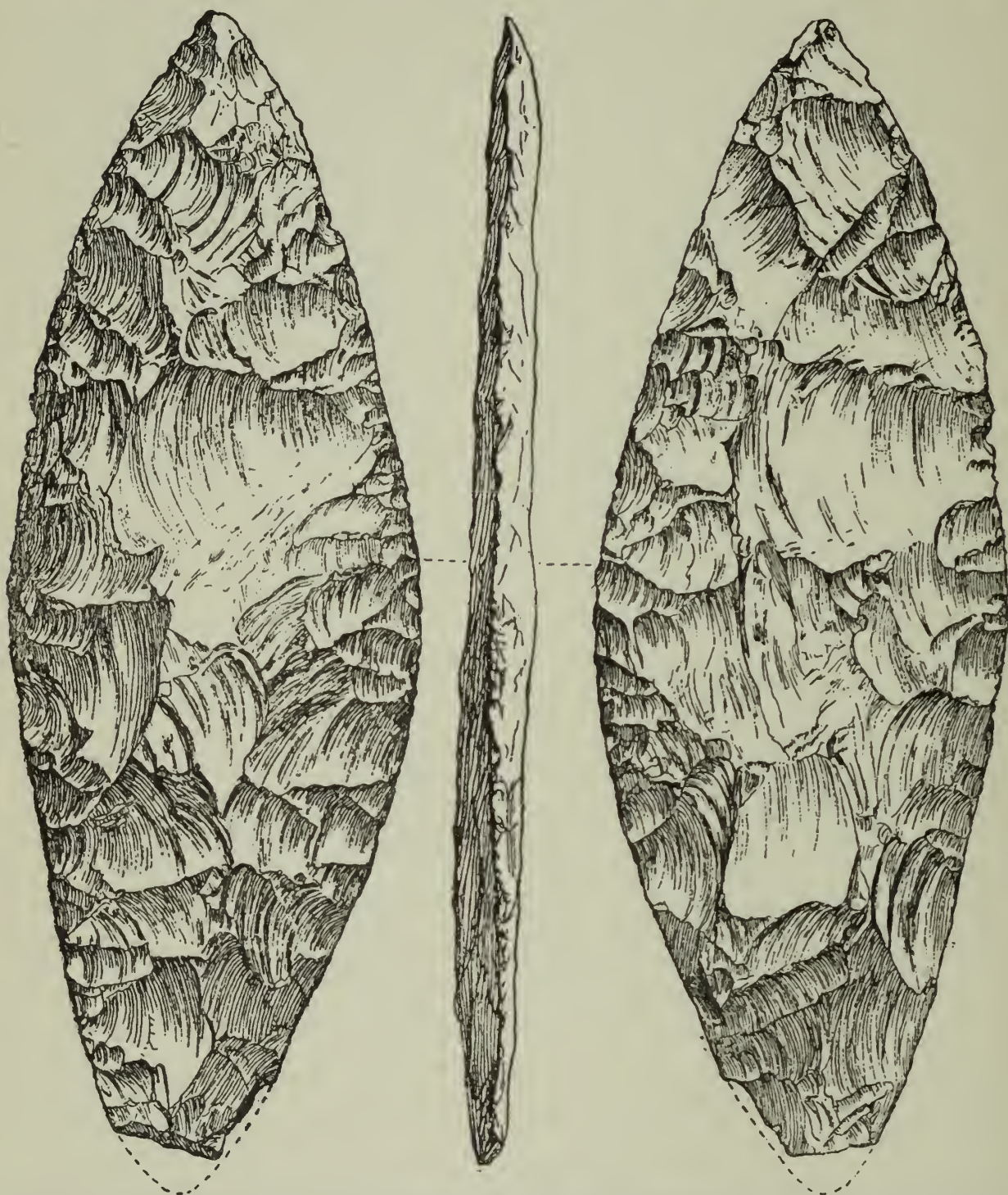


Fig. 52. Solutrean blade found below gravel at Bury St Edmunds. (Slightly reduced.)  
*P.S.E.A.*

upon the surface of the gravel underneath which they lay, there exists an Early Neolithic floor, thus demonstrating that the true Solutrean specimens long pre-date those attributable to the former period. In addition to the blades of Solutrean times other specimens of differing forms were made in this







IMPLEMENTS CLAIMED BY DR STURGE TO BE OF MAGDALENIAN TYPE  
(*A*) Dordogne caves, (*B*) surface of the ground, Suffolk. ( $\frac{1}{8}$ .) *P.S.E.A.*



epoch. There was, for instance, the shouldered-point formed from a flake with flaking covering its upper, convex surface, and with a clearly-marked hollow forming a "shoulder," at its narrower end. Dr W. Allen Sturge considered that he had examples of this type of specimen, referable probably to the Solutrean period,<sup>1</sup> in his collection, while Mr M. C. Burkitt has described a flint picked up on the surface at Lakenheath, Suffolk (Fig. 53), that he thinks may be a shouldered-point of Solutrean age.<sup>2</sup> Another type of implement of this culture phase was the elongated scraper with a scraping-edge at both ends, and a number of these has been found in East Anglia.

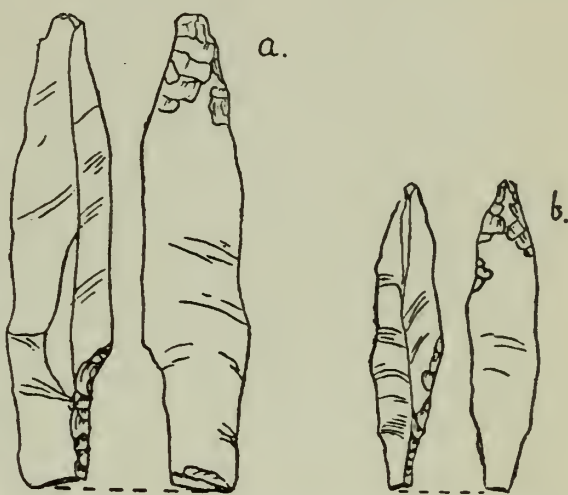


Fig. 53. Shouldered points of Solutrean age. (a) France, (b) Lakenheath, Suffolk. (Slightly reduced.) *Man*.

The period succeeding the Solutrean is that of the Magdalenian (named after the type-station of *La Madaleine*, in France). The flint implements of Magdalenian times fall far below, in excellence, those of the Solutrean, but while this is the case the workmanship in bone and ivory, and possibly in wood, of the Magdalenian people more than makes up for the comparative poorness of the flint technique. They were also great artists, and the paintings executed upon the walls of the caverns where they lived in southern France, and northern Spain, show this most conclusively. The late Dr Sturge claimed that he had found two floors in north-west Suffolk, of Magdalenian age, and laid particular stress upon that exposed at Wangford.<sup>3</sup> He also figured and described numerous implements of this period, which he claimed as representing graters (Plate XIII), blade scrapers, and parrot-beak tools, found upon the surface of the ground in the north-west part of the county. Dr J. E. Marr, F.R.S., has also published an account of a floor found by him on Wretham Heath near Thetford.<sup>4</sup> The specimens

<sup>1</sup> Sturge, W. A., *Proc. P.S.E.A.* vol. 1, pt 2, pp. 229-232.

<sup>2</sup> Burkitt, M. C., *Man*, January 1925, No. 1, pp. 11-12.

<sup>3</sup> Sturge, W. A., *Proc. P.S.E.A.* vol. 1, pt 2, pp. 225-227.

<sup>4</sup> Marr, J. E., *Proc. P.S.E.A.* vol. 1, pt 3, pp. 374-377.

he describes were found upon the surface of the ground, and comprise numerous long flakes, cores and calcined flints together with beautifully flaked end-scrappers, and flakes with battered backs, and were probably used as knives. Of these implements Dr Marr says that there is no doubt as to their Upper Palaeolithic character, and that they closely agree with specimens of the Magdalenian period.

Unfortunately, there are no ancient caves in East Anglia, so that the Magdalenian people of this area would have had no opportunity for indulging in their artistic leanings in painting the walls of such places with hunting scenes, and pictures of animals. Further, the places where the East Anglian Magdalenian implements have been found are not suitable for the preservation of bones and similar organic material upon which carvings were often made at this epoch. The only examples of ancient prehistoric art that would be likely to be preserved are those executed upon the surface of flints, and other stones, such as were used occasionally for this purpose in Upper Palaeolithic times. In 1914, Mr W. J. Lewis Abbott published an account of a brown quartzite pebble found upon the surface of the ground at Nayland, near the southern boundary of Suffolk, by the Rev. H. D. Gray who, for many years, had been engaged in archaeological pursuits.<sup>1</sup> Mr Gray, noticing the pebble had one side which had apparently been used as a rubber, showed it to Mr Abbott, and, upon the specimen being scrubbed, it became apparent that there was engraved upon one surface the figure of a goat in outline (Plate XIV, 1). The animal is represented most realistically with the left fore leg raised as if the creature were travelling up hill, or climbing over rough ground. Numerous examples of drawings of the goat have been found in caverns and rock shelters, containing Upper Palaeolithic deposits, upon the Continent, and, in some cases, these drawings are very similar to the Nayland specimen. There would appear to be no doubt that the drawing is executed in the Palaeolithic manner, and it may well have been done by a hunter of Upper Palaeolithic times, living in East Anglia. Mr Abbott has pointed out that quartzite being harder than flint it would be impossible to incise such a stone with this latter rock, and has suggested that the engraving was done with

<sup>1</sup> Abbott, W. J. L., *The Sphere*, January 31st, 1914.



(1) OUTLINE OF A GOAT ENGRAVED  
ON A QUARTZITE PEBBLE AND  
PROBABLY OF UPPER PALAEO-  
LITHIC AGE

from surface Nayland, Suffolk. (Nat. size.)

*S.I.A.*



(2) CHALK MAMMOTH

found at Great Glemham,  
Suffolk. *Man*







a quartz crystal possessing the requisite hardness, a suggestion supported by certain experiments carried out by him, and by his finding, on the surface of the same field where the discovery of the quartzite pebble was made, a crystal of the kind required. The engraving has been critically examined by Miss Nina Layard and by Miss Outram,<sup>1</sup> who regard the specimen as a genuine example of prehistoric art, which, from all the circumstances of the case would appear to be in every way probable. Apart from the Nayland specimen, no other example of Palaeolithic art has been found in East Anglia, with the possible exception of the engraved flints found at Grime's Graves, Norfolk, which will be discussed in a later chapter, and a shaped piece of chalk, an account of which I published in *Man*.<sup>2</sup>

This specimen was found upon the surface of the ground at Great Glemham House, Saxmundham, by the Hon. Robert Gathorne-Hardy. The piece of chalk is shaped to a form roughly resembling that of an elephant, and, in my opinion, bears marks showing that it has been modified by man with a view to increasing a natural resemblance to this animal. When I first examined the specimen, I thought that the whole of its present form had been due to human shaping, but the late Dr Charles Andrews pointed out that the piece of chalk was probably the internal cast of the chamber of an ammonite, which casts are known to assume an animal—pig-like—shape. It is quite possible that Dr Andrews' opinion is correct, but, after examining several of the internal casts of the chambers of ammonites, I feel confident that none of those I saw is really comparable with the Great Glemham specimen (Plate XIV, 2). Models of the mammoth, rudely carved in ivory, have been found in Upper Palaeolithic deposits upon the Continent of Europe, and recently the discovery has been notified of such a model formed out of sandstone.<sup>3</sup> No flint implements which can be said, with complete confidence, to be of Upper Palaeolithic date have been found at Great Glemham. Thus, while I do not wish to stress unduly the importance of Mr Gathorne-Hardy's discovery, I think, nevertheless, it should be placed

<sup>1</sup> Layard, N. F., *Proc. Suff. Inst. Arch. and Nat. Hist.* vol. xv, 1915, pp. 3-8.

<sup>2</sup> Moir, J. Reid, *Man*, February 1919, No. 2.

<sup>3</sup> Bayer, J., *Eine Mammutjägerstation in Losz bei Pollau in Südmähren*, Sonder-Abdruck, Leipzig, 1924.

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on record, as a highly possible example of the art of Late Palaeolithic man. The specimen was subjected to a very searching examination by me, and the above is my considered opinion upon it.

After the close of Magdalenian times the climate began to get warmer, and the reindeer and the mammoth, which, during this period had wandered far south of their usual habitat, retreated northwards. The period that followed represents the transition between the Palaeolithic and the Neolithic civilisations, when the art of flint flaking had fallen to a low ebb, and

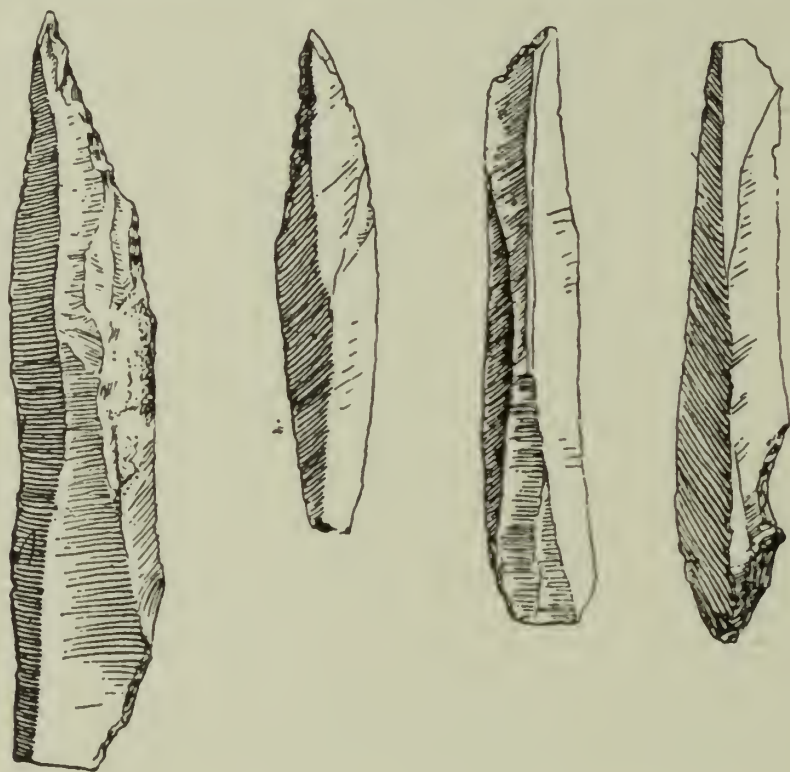


Fig. 54. Implements of Transitional type from a floor at Kelling, Norfolk. (Nat. size.) *P.S.E.A.*

large numbers of very small flakes with minute edge-trimming, and of characteristic geometrical forms were used for some unknown purpose. This transitional period is represented on the Continent at *Mas d'Azil* and *Tardenois* in France, and the deposits at these places have revealed typical flint implements, and, at the former site, curious painted pebbles, and harpoons made from the antlers of the red deer.

It is possible that one or other of the above phases of the transitional period may be represented at Wangford and Lakenheath, and at Kelling in Norfolk, where Mr J. E. Sainty has found a site upon the plateau at 200 feet o.d. where, at



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about 1 foot below the surface, occurs a floor very rich in the usual débris of a flint workshop, which has yielded many of the usual minute implements, also flakes with battered backs, points, scrapers, and numerous *burins*, or graving tools (Fig. 54).<sup>1</sup>

If the people of the Upper Palaeolithic times could come back to East Anglia they would not see many startling changes in the configuration of the country. But they would find that, owing to a sinking of the land, some of their ancient occupation-sites are now submerged, while their camps in the sheltered tributary valleys of Suffolk are now buried under varying depths of deposits, of different ages.

The great Palaeolithic period came to an end about 12,000 years ago, with the disappearance of the Magdalenian culture, and the cold climate associated with it. Thus, the close of the Great Ice Age witnessed also the termination of the Palaeolithic civilisations, which, for an immense period of time, had held sway in East Anglia.

<sup>1</sup> Sainty, J. E., *Proc. P.S.E.A.* vol. IV, pt 2, pp. 165-176.

## CHAPTER X

### *The Fossil Bones of Early Man*

THERE is no doubt that, as compared with the vast number of flint implements found in ancient deposits throughout the world, the discoveries of the bones of the human beings who made these implements are exceedingly rare. It is, of course, only to be expected that flint implements would be numerous, because, in the first place, every prehistoric man must have made a great many in his lifetime, as do primitive people of the present day, and, secondly, these specimens are practically indestructible, and so have survived the drastic vicissitudes of the past. The comparative scarcity of ancient human bones is also not a very surprising fact, as the population of early prehistoric times could not have been large, and, further, it is probable that, when an individual died, his body was left out in the open slowly to decay, or to be eaten by carnivorous animals. The fossil bones of man that are found in ancient gravel beds, and other water-laid deposits, are almost certainly those of people who were drowned, or whose bodies, left lying in the open, were swept away by floods, and buried in the gravel and other deposits then being formed. But, though these precious remains of man are rare, yet enough have been found to enable us to form a clear idea of the type of people inhabiting this earth in remote times, and there cannot be any question that, as we go back into the past, so the type of man becomes more and more primitive, and shows an ever-increasing similarity to those of the higher apes. Though the presence of man at any given period can be ascertained with certainty by the finding of his flint implements in the deposits of that period, yet the discovery of human bones is always regarded as a crowning triumph of research in prehistoric archaeology, and as setting the seal upon the former finds of flint implements. In this chapter I propose to deal with some of the more important discoveries of human fossil bones that have been made, and of the great antiquity of these remains. About thirty-five years ago, a remarkable



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discovery was made in Java by Professor Dubois,<sup>1</sup> who had been sent out by the Dutch government to explore certain deposits in that island which were known to be very rich in the fossil bones of animals. These researches were so fortunate as to result in the discovery of the upper portion of a skull, the thigh bone, and two teeth of a creature that, evidently, possessed both human, and ape-like, characteristics. The discoverer of these remains gave to them the name of *Pithecanthropus erectus*, or the "erect-walking, Man-ape", and there can be no doubt that, in many respects, this title is justified. The skull cap shows marked ape-like features, a great projecting, bony, ridge over the eye-sockets and very little "forehead", while the inside capacity of the skull has been shown to be intermediate between that of the higher apes, and the lowest type of man (Fig. 55). Though the skull-cap exhibits these remarkable characteristics, the thigh-bone and teeth, which must be referred to the same individual, approximate very closely to those of modern man. We thus see that, in this Javan discovery, there is placed before us a creature possessing

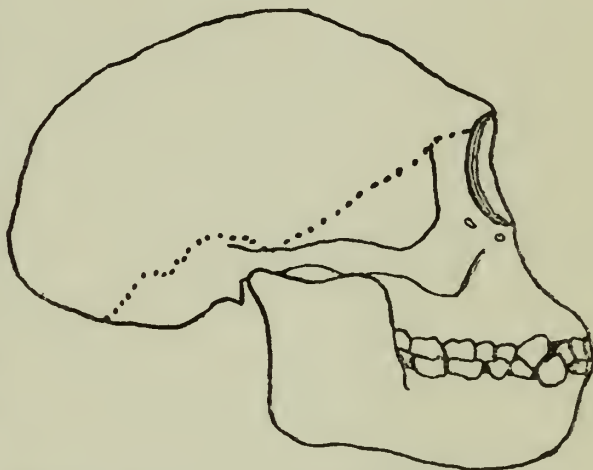


Fig. 55. Reconstruction of the skull of the Java Man, about  $\frac{1}{3}$  natural size. The portions actually found are represented by the area above the dotted line. (After Dubois.)

both ape-like, and human, resemblances, and such as, in all probability, made the primitive Eolithic flint implements. The exact geological age of this fossil has been, as is often the case with the remains of ancient man, in dispute, but it belongs either to the close of the Tertiary epoch, or to the beginning of the Quaternary.

Another very important find, of a human jaw-bone, in a fossilised condition, was made at Mauer, near Heidelberg in Germany, in 1907, at a depth of about 90 feet from the present surface of the ground.<sup>2</sup> The geological age of this

<sup>1</sup> Dubois, E., *Pithecanthropus erectus, eine menschenähnliche Urbergasform aus Java*, Batavia, 1894, 4to, p. 44.

<sup>2</sup> Schoetensack, O., *Der Unterkiefer des Homo Heidelbergensis, aus dem Sanden von Mauer, bei Heidelberg*, Leipzig, 1908.

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specimen is well known, and, from the animal remains found with it, is almost certainly of the same period as that of the Cromer Forest Bed of Norfolk, from which I have obtained a large number of humanly-flaked flints. The Heidelberg jaw-bone is a most impressive relic of early man (Fig. 56). Not only is its antiquity profound, but its massive size and brutal appearance at once rivet the attention of anyone examining it. The specimen shows no sign of a chin, and the ascending rami, those portions of the jaw which branch upwards from behind the rearmost molar teeth, are of extraordinary width and strength. It is obvious that the being who possessed a jaw-bone

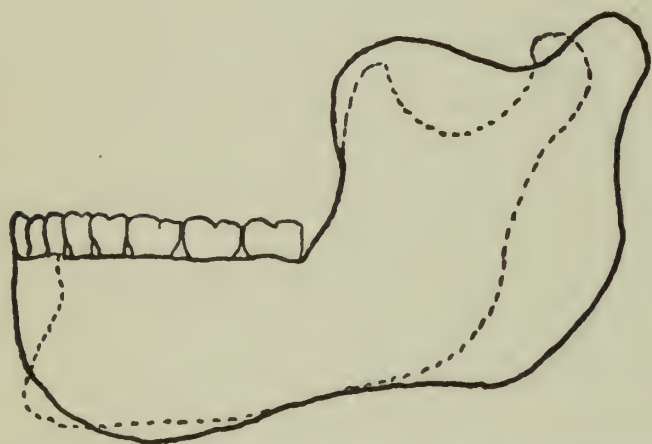


Fig. 56. Superimposed outlines of Heidelberg Jaw-bone (continuous line) and of Modern Man (dotted line).

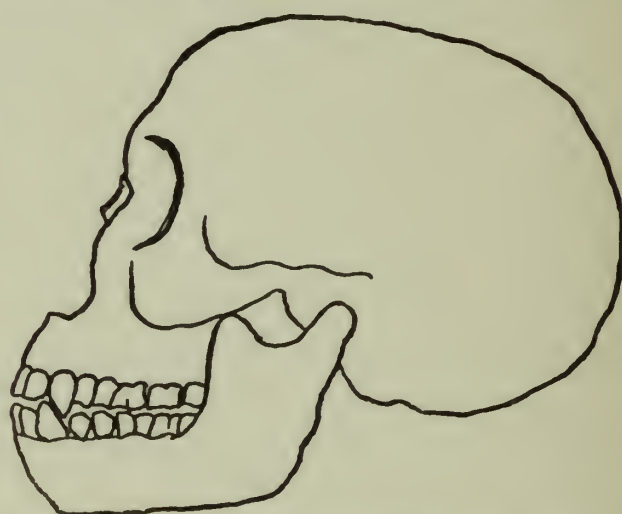


Fig. 57. Reconstruction of the skull and the jaw-bone of the Piltdown Man. (After Smith-Woodward.)

of this character most have been of almost gorilla-like proportions, in fact the jaw-bone itself, if the teeth had been missing, would have almost certainly been regarded as that of an ape. But, nearly all the teeth are present, and these are of a definitely human type. Thus in the Heidelberg jaw-bone we see again a strange combination of human and ape-like characters. We will now turn to a discovery made in our own country, namely, at Piltdown in Sussex.<sup>1</sup> Some years ago, the late Mr Charles Dawson of Lewes, when visiting a shallow pit, where gravel was being raised, obtained from a workman some portions of a very thick and fossilised human skull. This important find induced him to conduct diggings in the gravel pit, and eventually half of a lower jaw-bone, and a large canine tooth were discovered (Fig. 57). The gravel in which these

<sup>1</sup> Dawson, Chas. and Woodward, A. S., *Q.J.G.S.* March 1913, vol. LXIX.



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remains occurred is not far from the valley of the River Ouse in Sussex, and is evidently a very ancient deposit. Unfortunately, the gravel is not of a great depth, nor is it covered by any other bed which would enable us to "date" it geologically. Thus the exact age of the Piltdown deposit, though unquestionably very ancient, is not known, but the flint implements found in the gravel are of very early types such as we know occur in beds of the Late Tertiary, and Early Quaternary, periods in East Anglia. The skull and jaw-bone have been described by Sir Arthur Smith Woodward, and by Sir Arthur Keith, and show us, once more, an individual with human and ape-like characteristics. The skull is of definitely human form and shows no trace of the projecting ridge above the eye-sockets, such as is so prominent a feature in some early types of man. The bones of this skull are very thick, but, otherwise, in its general outline, there is nothing very ape-like about it. But when we turn to the jaw-bone we see a very different picture, for it possesses many ape-like characters. There is the usual absence of a chin, and the whole aspect of the specimen is very primitive. But, the most outstanding peculiarity about it is the fact that the canine teeth stick up above the level of the others, in the same way in which the apes' canines project. Never before has an individual been discovered with a definitely human skull, and with jaws showing canine teeth of this kind, and the Piltdown discovery is thus of great importance to all those interested in man's ancestry. It is possible that the fossil remains I have described, viz. those of Java, Heidelberg, and Piltdown, lived during the warm climatic phase, intervening between the First and Second Glacial periods, to which I referred in the previous chapter, and are possibly 500,000 years old.

We must now pass on to a later epoch, when the Third Glacial episode was beginning, and Western Europe was peopled by a strange race whose remains have been found in caves and rock shelters over a large area of country. These human beings are known by the name Neanderthal, because the first skull of this race was found in a cave in the valley of the Neander in Germany.<sup>1</sup>

A very great deal is known of these early people because

<sup>1</sup> Müller's *Archives*, 1858, p. 453.

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several nearly complete skeletons have been found—the oldest interments as yet discovered. The Neanderthal race used very characteristic, and well flaked flint implements, and was associated with a large number of cold-loving animals, whose remains have been found in the deposits of this period. The skulls of these people were very long and thick, and had a great bony ridge extending across the eye sockets (Fig. 58). An examination of the leg bones of this race has shown that they walked probably with a slouching gait, and by the position of the *foramen magnum* (the aperture through which the spinal cord passes to the brain) at the base of the skull, it is concluded,

LONG, LOW SKULL  
PROJECTING AT  
HINDER PORTION

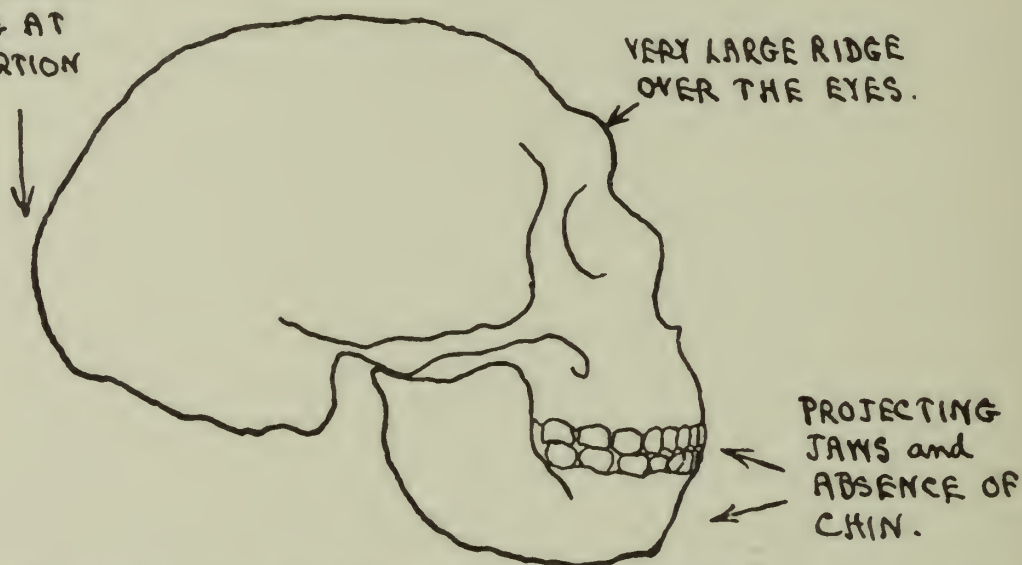


Fig. 58. Outline of skull and jaw-bone of a primitive Neanderthal man who lived about 40,000 years ago.

with their heads projecting forwards. So far as we know, the Neanderthal people eventually became extinct, but their bones tell human anatomists a wonderful story of one of the ancient types of man inhabiting Europe in remote prehistoric times.

Before, however, this race entirely disappeared, a new and much higher type of prehistoric hunters had entered Western Europe, bringing with them a hitherto unknown culture. The first discovery of skeletons of these people was made in the rock shelter of *Cro-Magnon*, in France,<sup>1</sup> where they had been buried, and revealed a type of individual of commanding height, long headed, and with jaws and limb bones comparable with those of the highest races existing to-day. My friend Sir Arthur Keith has indeed likened these human beings of Late

<sup>1</sup> Lartet, Henry and Christy, Henry, *Reliquiae Aquitanicae*, p. 67.



Palaeolithic times to the Sikhs of India, while others, because of their artistic powers, have given to them the name of "the Palaeolithic Greeks". The origin of the Cro-Magnon people as they are called is somewhat obscure, but as it is clear they could not have developed from the brutal Neanderthals—their ancestors must be looked for in pre-Neanderthal times, and it is probable that the well-known Galley Hill (England),<sup>1</sup> Clichy (France),<sup>2</sup> and other discoveries of human bones of modern type in very ancient deposits, represent these ancestors. There would seem no doubt as to the great antiquity of the modern type of man of which the Cro-Magnon people of about 30,000 years ago were such splendid physical examples.

Turning to East Anglia we find that several discoveries have been made there of ancient human bones that are of much interest to students of early man. As has already been mentioned (p. 32) there was found, in 1855, a human lower jaw-bone said to have been derived from a depth of 16 feet in the Red Crag at Foxhall Hall, near Ipswich.<sup>3</sup> This specimen (Fig. 59), however, was not seen *in situ* in this deposit, by any competent scientific person, and it is not possible,

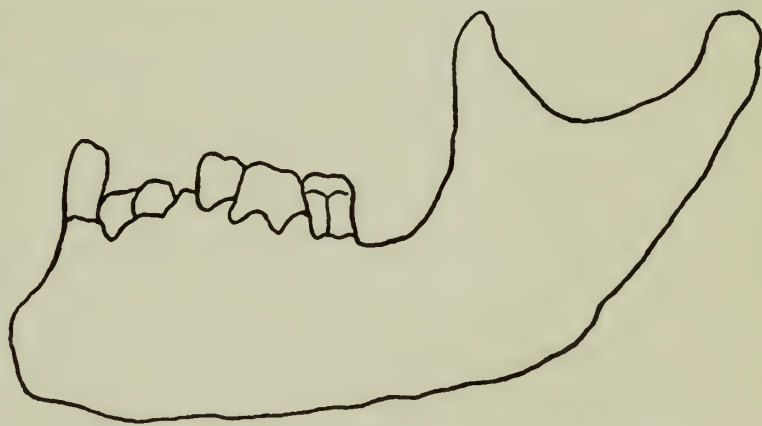


Fig. 59. Outline of the Foxhall jaw-bone.

therefore, to state with certainty that the bone is of Red Crag age. The story of this relic is, briefly, as follows:

In the days when the lumps of phosphatised clay, the so-called coprolites, found, usually, below the Red Crag were being exploited for commercial purposes, large areas of ground were turned over at Foxhall, among other places. It was then that large collections of Crag fossils were made by geologists, and others, who visited the pits, and encouraged the workmen to preserve the desired specimens. In 1855 there was living

<sup>1</sup> Newton, E. T., *Q.J.G.S.* 1895, vol. LI, p. 505; Keith, Sir Arthur, *The Antiquity of Man*, pp. 178–193.

<sup>2</sup> Keith, Sir Arthur, *The Antiquity of Man*, pp. 202–204.

<sup>3</sup> Collyer, R. H., *Anthropological Review*, vol. V, pp. 221–229; Moir, J. Reid, *Proc. P.S.E.A.* vol. III, pt 3, pp. 390–411.

in Ipswich a Mr John Taylor, a druggist, who collected fossils, and one day he had brought to him by a workman a human jaw-bone which had been turned out, with the coprolites, from a cart at Messrs Packard's phosphate works at Bramford. Taylor bought the bone for the sum of 2*s.* 6*d.*, and it eventually found its way into the hands of a Dr Robert H. Collyer, an American doctor practising in England, who described and exhibited the specimen before the Ethnological Society of London. Collyer gave a very good description of the bone which, in his opinion, was in a fossilised condition, and exhibited, on its surface, a peculiar metallic lustre indicative of antiquity. At the time when this discovery was made very little was known concerning the antiquity of man, and a human jaw-bone claimed to have been derived from the Red Crag was, no doubt, regarded as an impossibility. The specimen was examined by Falconer and Busk, who while pointing out that the bone was infiltrated through with iron, and that it was of a very great antiquity, nevertheless refused to regard the specimen as of Red Crag age. The illustration published by Collyer is somewhat indifferent, but it seems clear that the jaw does not show many primitive characteristics, such as would be expected by most scientific people, in a bone of this antiquity. If the place of origin of this jaw is as alleged it corresponds very closely with the 16 foot level in the Red Crag at Foxhall Hall, where I found the remains of an ancient land surface with flint implements, and where, it is possible, a human jaw-bone might have been discovered. Further, at this level were numerous fragments of animal bone which also bore, in most cases, a marked metallic lustre, and when analysed showed that they contained almost precisely the same amount of animal matter as the analysis of a fragment of the Foxhall jaw-bone contained, viz. 8 per cent.

It appears that Dr Collyer took the specimen with him when he returned to America, and no trace of the bone can now be found. This is to be regretted, as an examination of the actual specimen would provide tolerably certain evidence as to its Crag age or otherwise, and if Collyer's claim was substantiated, this bone would become the most ancient remains of the human skeleton yet discovered.

In the chapter dealing with the East Anglians of Second



## THE FOSSIL BONES OF EARLY MAN

Inter-Glacial times, I described the beds at Hoxne, Foxhall Road, Ipswich, and elsewhere, which are composed of brick-earth and other materials laid down in lake-like hollows in the older deposits. We are now to visit one of these filled-in channels at Westley, near Bury St Edmunds, on the River Lark, in West Suffolk, where, in 1882, part of the vault of a fossilised human skull was found (Fig. 60) at a depth of  $7\frac{1}{2}$  feet in brickearth.<sup>1</sup> The discovery was, as is usually the case in such matters, made by workmen engaged in removing the clay for brick making, but Mr Henry Trigg, a well-known archaeologist of Bury, was soon informed, and he was able to verify

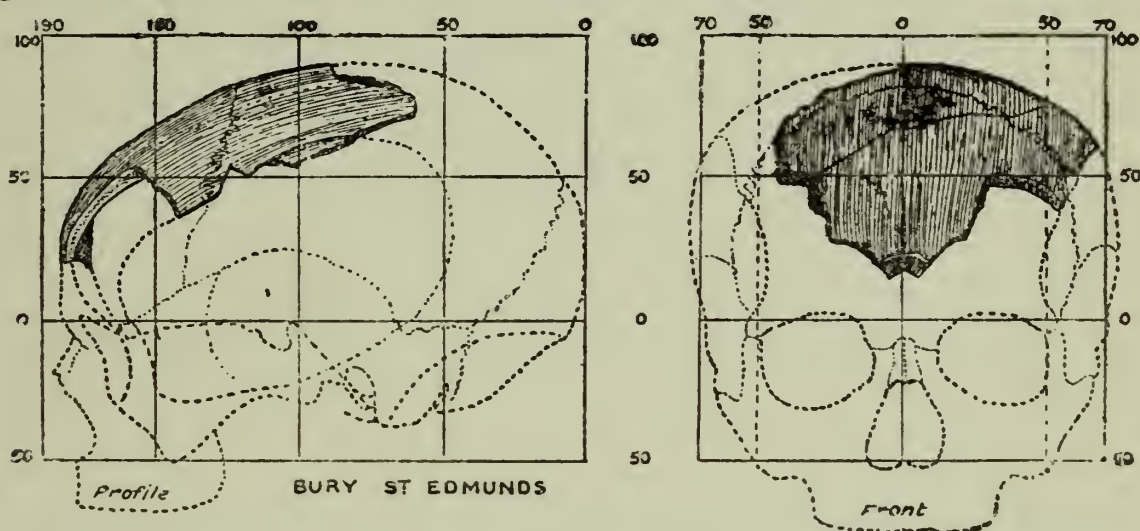


Fig. 60. Side and front views of the Bury St Edmunds skull fragment (shaded portion). (After Keith.)

the find and to preserve it for examination. In the brickearth at this place remains of the mammoth occurred, together with unrolled flint implements of Late Acheulean type. It is obvious, therefore, that the filled-in channel at Bury St Edmunds is of the same age as those at Hoxne and Ipswich, and it would be of much interest to be able to visualise the type of man living in East Anglia in those remote days. Unfortunately, the piece of human skull preserved is not very large, and we cannot, in consequence, form a very detailed picture of what its owner was like. The specimen which has been examined and described by Sir Arthur Keith,<sup>2</sup> represents the upper two-thirds of the frontal bone, and the anterior third of the right and left parietals. The fragment, which is fossilised and of a greyish brown colour, is preserved in the Museum at

<sup>1</sup> Smith, W. G., *Man the Primæval Savage*, pp. 280-284.

<sup>2</sup> Keith, Sir A., *The Antiquity of Man*, pp. 171-177.

Bury St Edmunds. The bone evidently formed part of a skull not over long, but very wide, and flat upon the top. It is apparently not of the Neanderthal type, and this point is of great interest, as the Acheulean people preceded, in Europe, the former race.

There is not much doubt that, so far as can be judged from the small portion of skull preserved, the Bury St Edmunds individual approximated in head form to that of modern man, and this further supports those who believe in the great antiquity of this type of human being. Some illustrations of the flint implements found in the brickearth at Westley are given in Evans' *Ancient Stone Implements of Great Britain* (Second edition, p. 544).<sup>1</sup>

On the east bank of the River Gipping at Ipswich the Upper Chalky Boulder Clay covers most of the high ground which rises to a height above sea-level of about 150 feet. The Boulder Clay overlies glacial sand and gravel, and for many years, Messrs A. Bolton and Co. excavated this material in a large pit, now abandoned, at the upper part of the small valley in which their brickfield lies. Upon the southern side of this pit, where the slope of the valley begins, the material above the glacial sand and clay is about  $3\frac{1}{2}$  to 4 feet in thickness, and beneath this was found, in October 1911, the greater part of a human skeleton.<sup>2</sup> Fortunately, the workman who made this discovery realised that he had found something of importance, and immediately communicated with one of the owners of the pit, who happened to be in the vicinity. This gentleman at once informed me of what had been found, and I lost no time in going down to the pit, with which, for some years, I had been familiar. Upon my arrival I saw that, under the hard compact material overlying the glacial sand were embedded partly in the sand and partly in the superjacent clay, a number of human bones of a lightish brown colour, and showing, where fractured, a chalk-like consistency. An examination of the stratum overlying the human bones showed no sign whatever of a grave having been dug down from the present land surface, and I have no doubt, and in this I had at the time the support of others who also examined the material, that no such

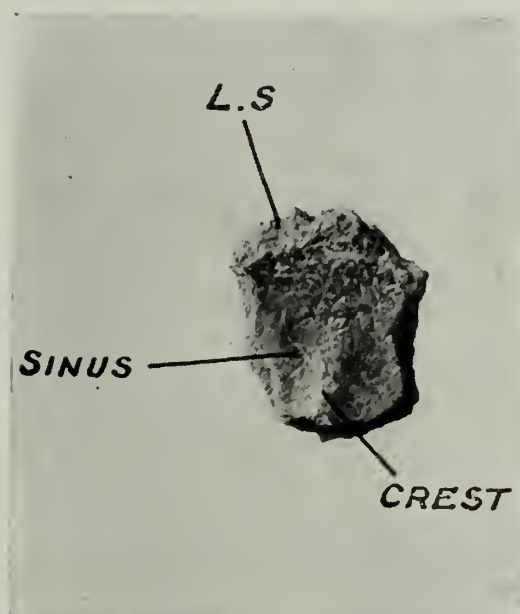
<sup>1</sup> Evans, Sir J., *Ancient Stone Implements of Great Britain* (2nd edition), pp. 542-543.

<sup>2</sup> Moir, J. Reid and Keith, Sir A., *Journ. Roy. Anthr. Inst.* 1912, vol. XLII, p. 345.

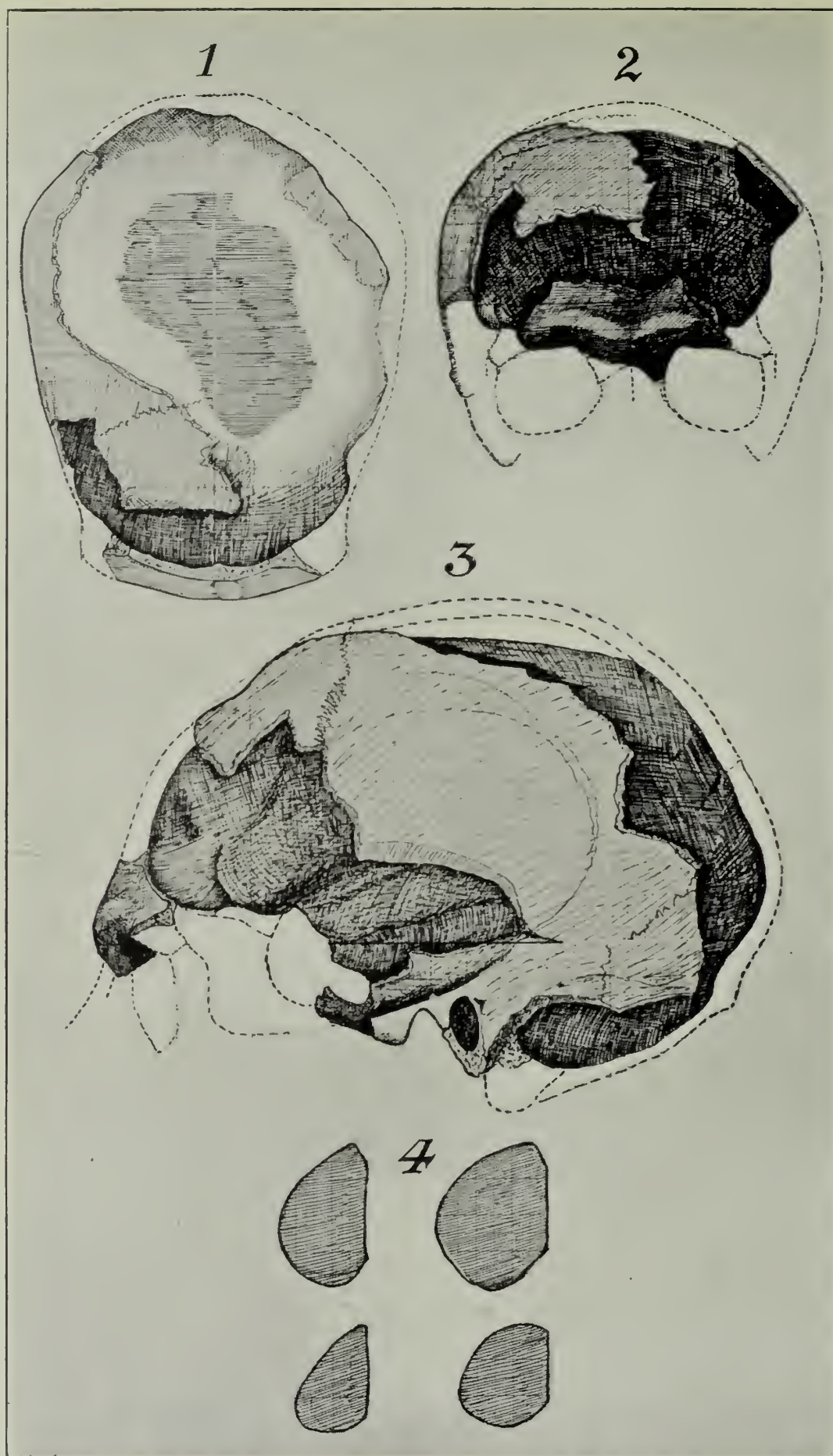




(1) THE REMAINS OF THE IPSWICH MAN  
showing the bones still embedded in the original matrix. (After Keith)



(2) PORTION OF HUMAN SKULL  
found in Lower Floor in Messrs Bolton and Co.'s  
brickfield, Ipswich. ( $\frac{1}{2}$  nat. size.) *R.A.I.*



DRAWINGS OF SKULL AND SECTION OF SHIN BONE OF  
THE IPSWICH MAN

(After Keith.) *P.S.E.A.*

- (1) Vertex view. (2) Full-face view. (3) Profile view.  
(4) Left, modern tibia; right, tibia of Ipswich Man



grave had ever been dug at this spot. On the day following its discovery the human skeleton was dug out, and we found that the stony clay above it was so hard as to necessitate the use of picks in its removal. Further, the bones and the clay were so mixed up together that it was decided to remove them in large lumps, which were sent off to the Royal College of Surgeons in London (Plate XV), where they were treated most skilfully and successfully by Sir Arthur Keith.

At the time of the discovery of the Ipswich Man, as he has been called, the deposit above the glacial sand and gravel had been always regarded as Chalky Boulder Clay *in situ*, and in those days it was believed that this bed pre-dated the earliest Palaeolithic flint implements, so that any human bones found under this Boulder Clay would be, as was then supposed, of a hitherto unexpected antiquity. It may be imagined, therefore, that the discovery of a nearly complete human skeleton below what I and others claimed as undisturbed Boulder Clay, created a great deal of excitement and speculation in scientific circles. When also it became apparent from Sir Arthur Keith's examination, that the person found was of the modern type and had been buried in a contracted posture (Fig. 61), such as was usual in Neolithic times, there were many who were unable to accept my view as to the geological age of these remains. At that time, however, I was of the opinion that the stratum above the glacial sand and gravel was decalcified Chalky Boulder Clay, an opinion supported by the late Mr William Whitaker, F.R.S., a very well-known and able geologist, who examined the section after the skeleton had been removed. The individual recovered was evidently of the male sex and about 5 feet 10 inches in height, and apparently between 30 and 40 years of age.

His skull was low in height and not very long (Plate XVI), while his molar teeth were much worn down indicating the use of a diet containing very hard constituents. The only astonishing and peculiar feature of the whole skeleton is provided by the tibia, or shin bone. This differs markedly from the modern type, as it possesses no anterior shin, or crest (Plate XVI). Sir Arthur Keith points out that the bone exhibits not the slightest appearance of an inflammatory change, nor of any pathological alteration in its form, and concludes that

## THE FOSSIL BONES OF EARLY MAN

this absence of a shin may turn out to be a characteristic of the race to which the Ipswich Man belonged. For some time

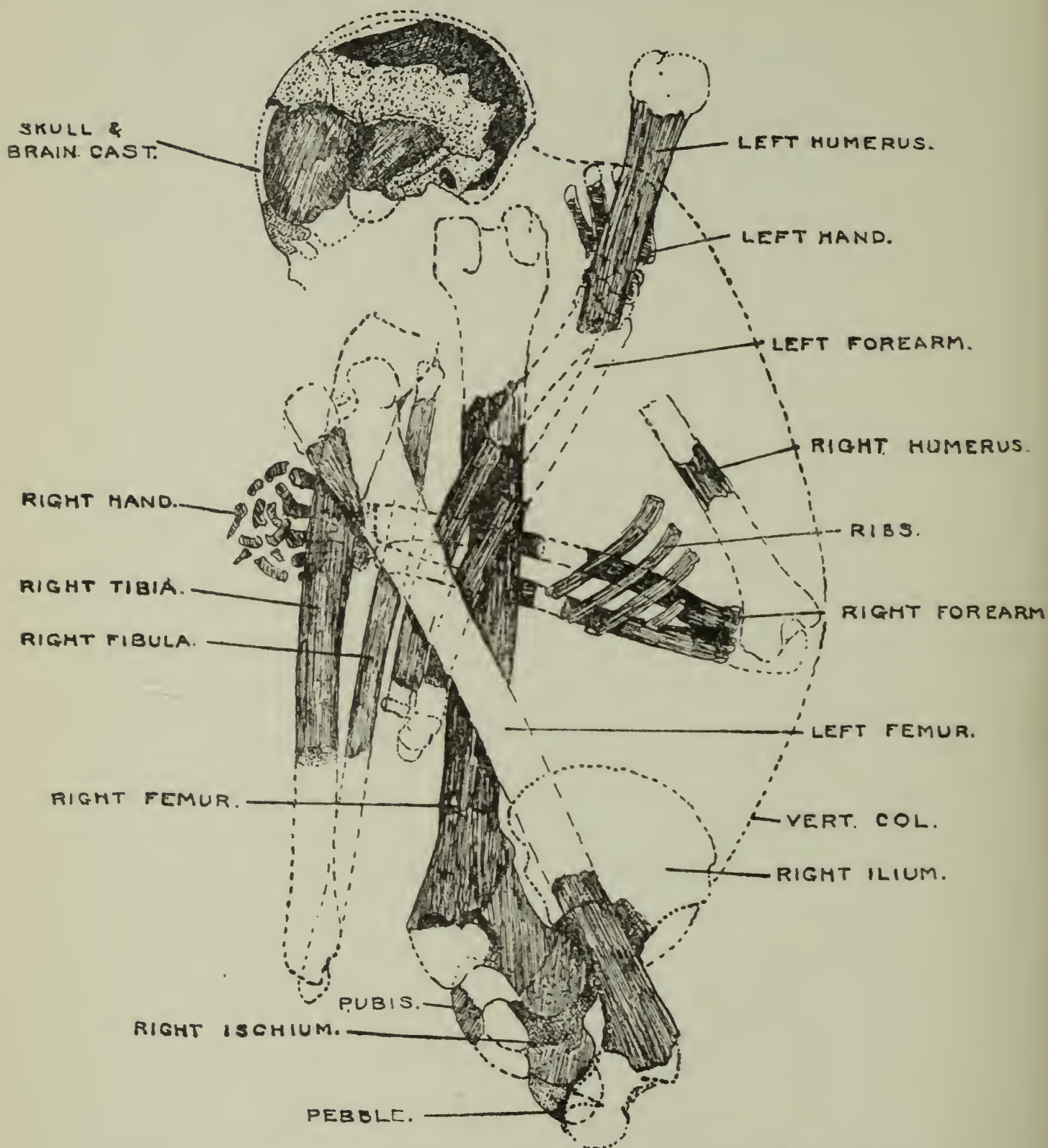


Fig. 61. The position of the body of the Ipswich man. (After Keith.) *R.A.I.*

after the discovery the eastern side of the pit was not further excavated, and, in the meantime, I had conducted a number of diggings in the adjacent valley which had provided me with a quantity of new evidence regarding the ancient floors,



or occupation levels, present there. This evidence induced me to carry out further excavations close to the place where the Ipswich Man had been found, and resulted in the discovery of a number of flint implements, and certain pieces of primitive pottery, of the same kind as those found in the Lower Floor of the valley. These specimens occurred at the surface of the glacial sand and therefore at the same horizon at which the human skeleton was found, and I, therefore, carried out a further minute examination of the material above the sand, and realised that, in all probability, it represented a deposit of re-made Boulder Clay that had been laid down in the form of a sludge over the place where the human bones were buried. When I felt satisfied of the truth of this conclusion, I at once made public my changed opinion regarding the age of these bones,<sup>1</sup> which I think, without much doubt, represent those of an individual living at the time of the occupation of the Lower Floor, and probably therefore of Lower Aurignacian, Palaeolithic age. The material above the bones is, almost certainly, the equivalent of the hill-wash that seals in the floors in the valley, and was laid down during a cold period obtaining in Upper Palaeolithic times. Since the discovery of the Ipswich Man a great change has come over the view as to the cultural age of the Chalky Boulder Clay. We now know that this deposit represents the latest Boulder Clay of East Anglia, and was deposited after Early Mousterian times, so that, instead of being of pre-Palaeolithic age, as was formerly thought, it must be referred to the latter part of the Lower Palaeolithic epoch. It was in fact just prior to the deposition of this Boulder Clay that the Bury St Edmunds Man lived, and he, as was seen, is of the modern type.

Mention has already been made (p. 88) of the fragmentary human bones exhibiting a dark brown colour found in the Lower Floor where it was exposed in the south-west corner of Messrs A. Bolton and Co.'s brickfield.<sup>2</sup>

These specimens consisted of (*a*) a portion of the upper part of the occipital bone of a skull, (*b*) a part, with the articular ends missing, of a stout femur, or thigh bone, and (*c*) a

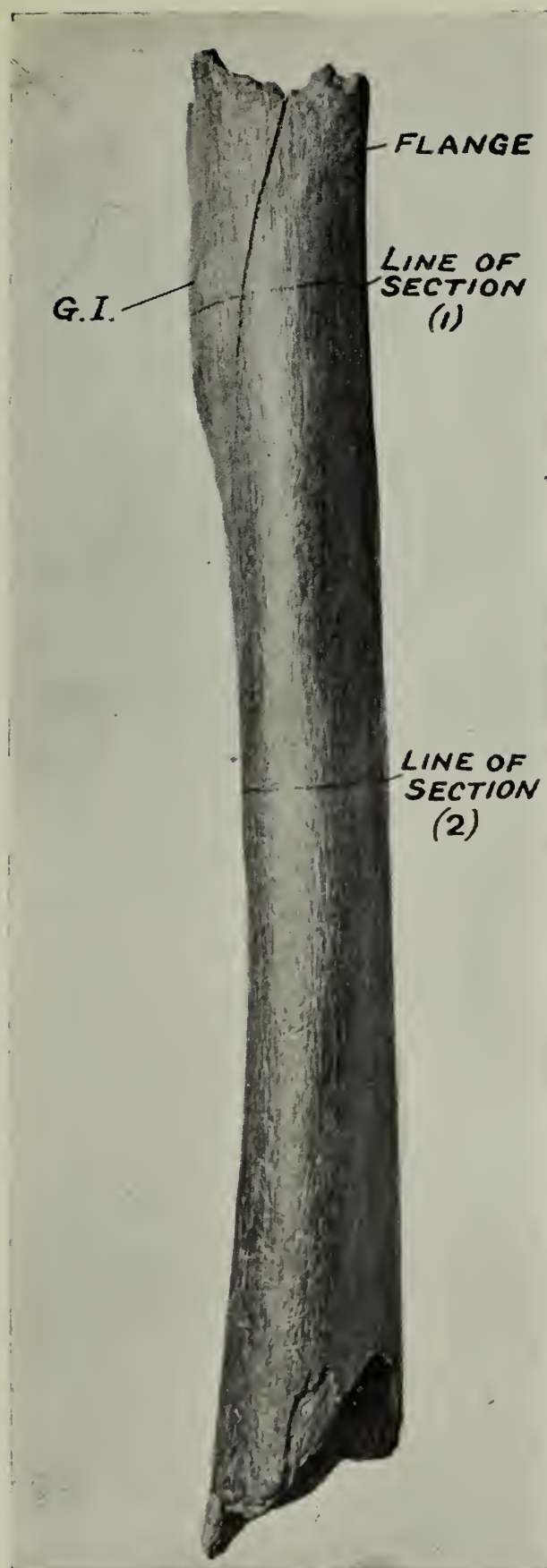
<sup>1</sup> Moir, J. Reid, *Nature*, October 12th, 1916.

<sup>2</sup> Moir, J. Reid, *Journ. Roy. Anthr. Inst.* vol. XLII, 1917, July to December, pp 385-391.

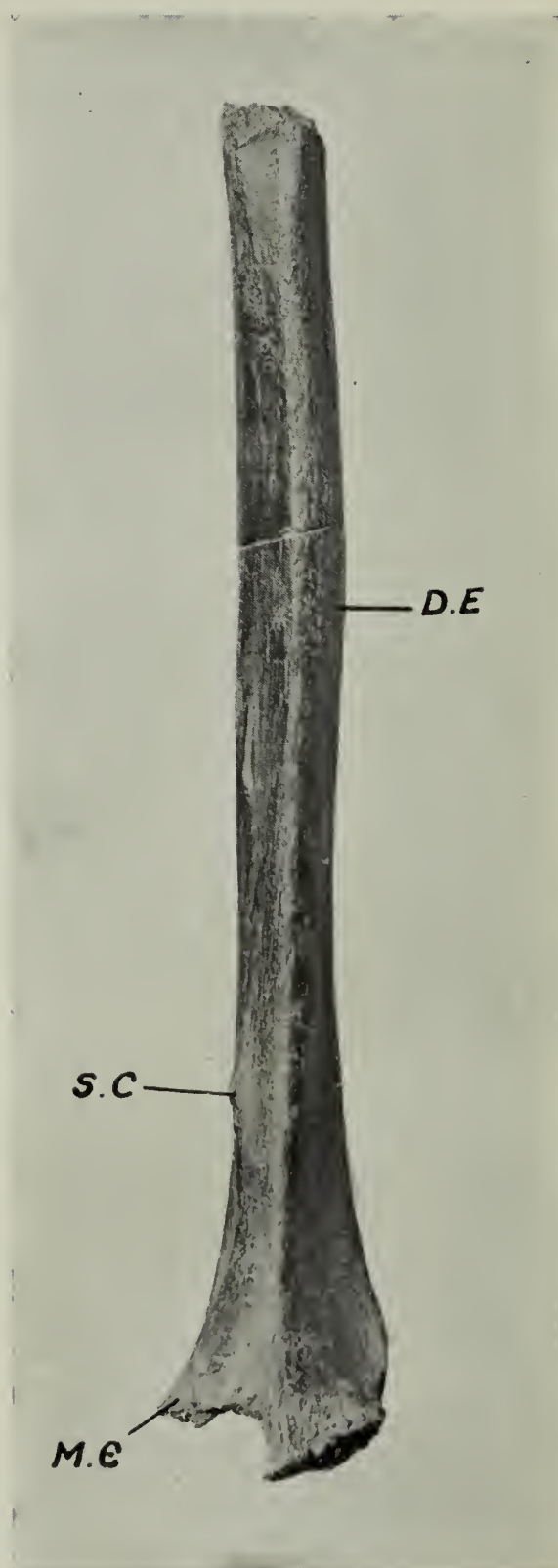
somewhat slender humerus, or arm bone (Plate XVII, 1 and 2).

Regarding these Sir Arthur Keith states that he thinks they are not to be referred to one and the same individual, and that the persons represented were of the modern, as opposed to the Neanderthal type. Dr W. L. H. Duckworth considers, however, that the femur shows, especially in its upper end, where a prominent flange-like process is present, certain Neanderthaloid characters. It is highly probable that these bones and those of the Ipswich Man, which are now preserved in the Museum of the Royal College of Surgeons, Lincoln's Inn Fields, are of the same age, but they differ much in appearance owing to the differing nature of the material in which they were embedded. Though only a few of the non-East Anglian discoveries of ancient human bones are here mentioned, yet it will be realised that these remains are of much interest and importance, and throw a flood of light upon the antiquity and physical characteristics of the past races of mankind.





(a)



(b)

HUMAN BONES

found in the Lower Floor in Messrs Bolton and Co.'s brickfield, Ipswich.

(a) Femur, (b) Humerus ( $\frac{1}{2}$  nat. size). R.A.I.





*The Neolithic period in East Anglia*

FOLLOWING upon the disappearance of the Upper Palaeolithic races, East Anglia was invaded by a race of long-headed people coming from the east, and with their advent the last phase of the Stone Age was begun. Though we speak, I fear somewhat glibly, of the disappearance of this or that race in prehistoric times, yet no one, so far as I know, has any reliable ideas as to how these disappearances were brought about. Sometimes it is suggested that the inhabitants of a country were exterminated by the newcomers, as in the supposed elimination of the Neanderthal people by the incoming Aurignacians, but this seems to be a somewhat improbable happening. There would, it may be imagined, be sanguinary conflicts between the contending races, but when the invaders eventually got the upper hand, the two peoples would settle down and intermarry, and the culture of the conquerors be gradually adopted all over the country. This, it would appear, is what took place when the Neolithic people invaded England. The earliest phase of this period—viz. that of *Maglemose*, in the Danish island of Zealand—has not yet been discovered in East Anglia, while the succeeding phase, named after *Le Campigny* in France, is perhaps only represented by some flint implements found upon the shore at the mouth of the River Deben, in Suffolk, and described by Miss Nina Layard.<sup>1</sup> The most characteristic implement of this period is the *tranchet* axe, in which the broader end has been shaped by skilful flaking into a chisel-like cutting

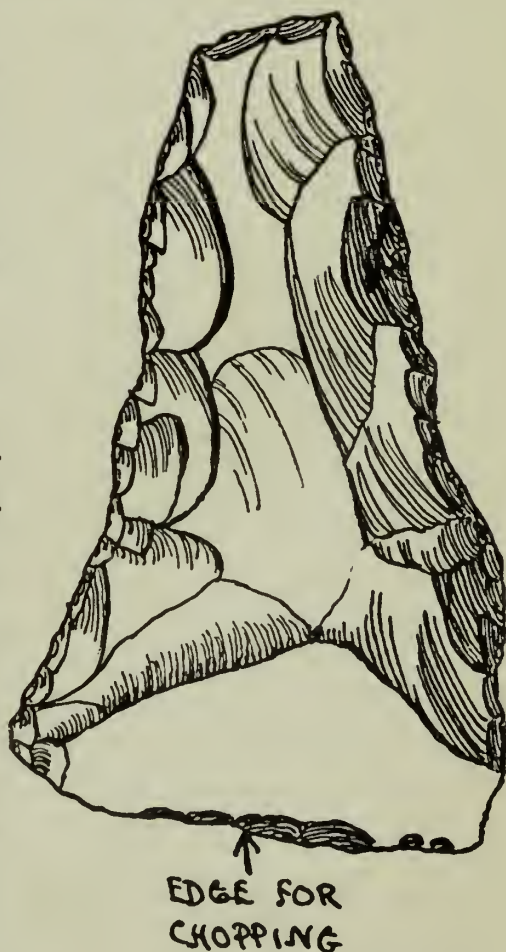


Fig. 62. *Tranchet* axe of the Neolithic period.

<sup>1</sup> Layard, N. F., *Proc. P.S.E.A.* vol. II, pt 1, pp. 132-134.

edge (Fig. 62). The best-known site in East Anglia where large numbers of flint implements of supposedly Neolithic date have been found is at Grime's Graves in south-west Norfolk. The name of this place should be really "Grimm's Graves". Grimm was a Norwegian water-sprite, or fairy, whose existence was believed in by the credulous Norsemen of long ago, and when in their wanderings, they came to any place that presented peculiar and unknown features, they often called it "Grimm's Grave" or "Grimm's Dyke"—as the case might be.

Now, at Grime's Graves there are some 20 acres of heath-land, lying at a level of about 120 feet above the sea, where are to be seen as many as 366 more or less circular depressions in the surface of the ground, and, for many a long day these depressions were regarded as graves. Now, however, we know, thanks to archaeological researches, that these hollows represent partially filled-in pits sunk into the chalk by prehistoric man to obtain a special kind of flint for implement making.

These pits, which must all be about 30 feet deep and the same width at the mouth, were excavated by means of deer's antlers as picks, and flat bones as shovels, and give us a very graphic picture of the immense trouble to which ancient man went in order to provide himself with first-class material from which to make his implements and weapons.

The first noteworthy investigation of this site was made by Canon Greenwell<sup>1</sup> who opened one of the pits on the east side of the Graves. This pit was excavated during the years 1867-70, and the basal part with radiating galleries exposed. In one of the latter a polished basalt axe was said to have been found, and this fact, together with others of a less definite nature, influenced archaeologists in assigning a Neolithic age to Grime's Graves. In the early part of 1914,<sup>2</sup> however, The Prehistoric Society of East Anglia, in view of certain claims as to the age of these flint mines, put forward in an important paper by Mr Reginald Smith,<sup>3</sup> decided to open two selected pits in order that the whole question of the period to which they belonged should be re-examined. The excavations showed that

<sup>1</sup> Greenwell, Canon, *Journ. Ethn. Soc.* January 1871.

<sup>2</sup> *P.S.E.A. Report on the Excavations at Grime's Graves, Weeting, Norfolk*, March-May, 1914, H. K. Lewis, London.

<sup>3</sup> Smith, R. A., *Archaeologia*, vol. XIII, pp. 111-147.







INTERIOR OF ONE OF THE GALLERIES AT GRIME'S GRAVES. P.S.E.A.



the ancient people who undertook this vast work at Grime's Graves were expert miners. The chalk in the area is covered first by a layer of Upper Chalky Boulder Clay of glacial origin, and above this clay is a deposit of sand which reaches up to the surface soil. These beds above the chalk average 10 feet in thickness, and not being composed of very hard material would be likely to cave in when the pit was originally dug. To obviate this the prehistoric miners had sunk their shaft through the sand and Boulder Clay, with a good "batter" or slope, but when the hard chalk was reached the walls of the pit were found to be nearly vertical. In making their excavation the Grime's Graves people cut through two layers of flint in the chalk. They do not appear to have used these however, but to have continued the digging until the desired layer of flint was reached. When this was accomplished, lateral galleries were driven following up the vein of flint, and radiating from the bottom of the shaft, and, upon a point being reached where it was no longer easy to transport the stone to the surface (this being done probably by means of haulage by thongs), another pit was sunk adjacent to the first, and the excavated material tilted into the empty abandoned shaft. Thus in the recent diggings, which were conducted very ably by Dr A. E. Peake, it was found that the pits investigated were filled with a series of such tilted material alternating with bands of sand, and boulder clay containing land shells, which had silted in under atmospheric conditions (Fig. 63). It was clear also that the filling in of these pits was not done very rapidly, as hearths, flint implements, fragments of rough pottery, animal, and some human bones, were found at various levels in the shafts showing that they were occasionally occupied by man. There is not much doubt that, if the whole area of Grime's Graves could be excavated, it would be found that all the pits are joined up to each other by the galleries radiating from the bottom of the shafts (Plate XVIII), and when this is realised, the magnitude of the work carried out at this spot in prehistoric times is seen to be enormous.

The excavations carried out in 1914 brought to light a large number of the antlers of the red deer that had been used by the miners for loosening the chalk, and some of these primitive picks were seen lying in a carefully disposed heap as left by



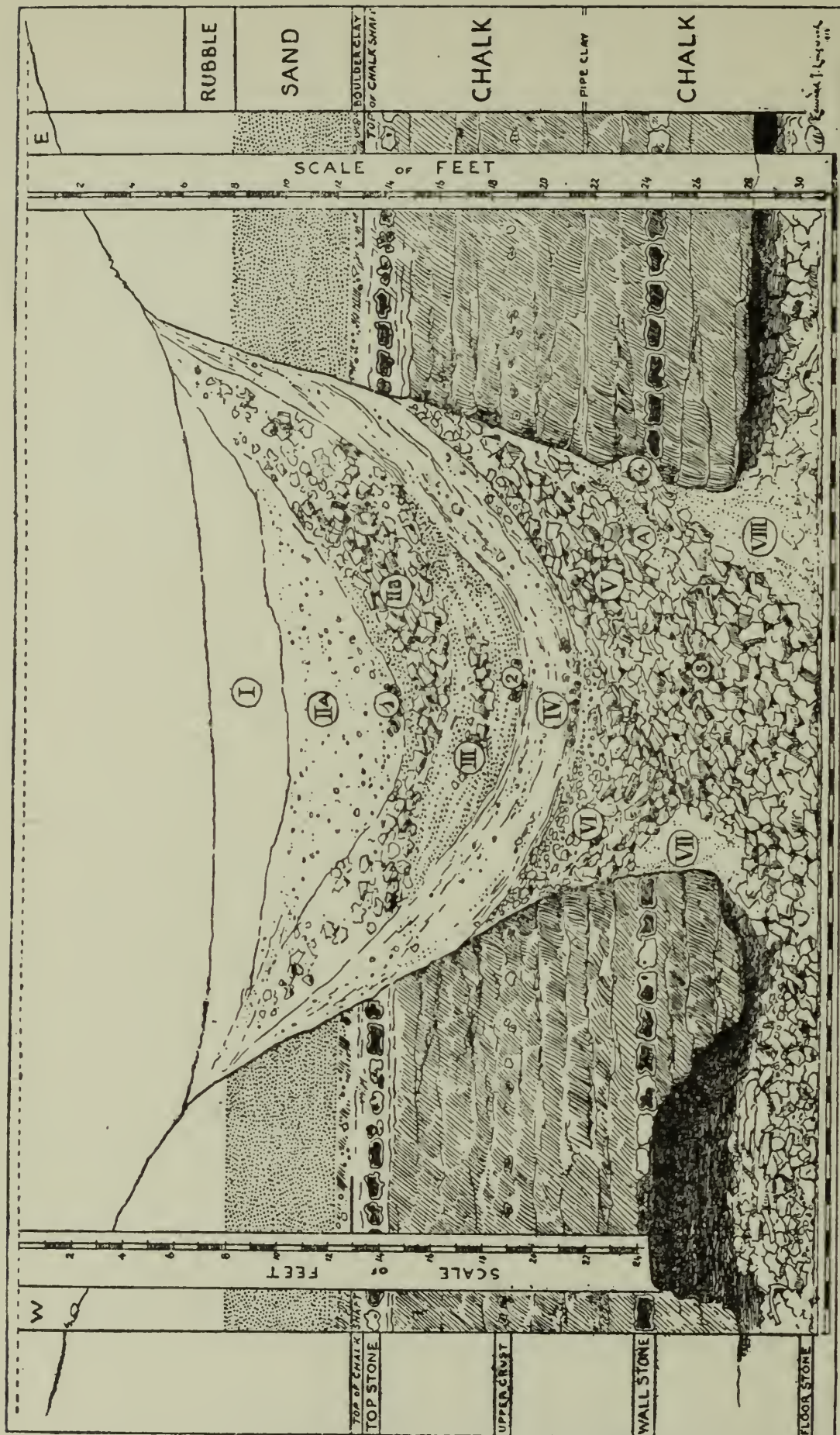


Fig. 63. Section of pit at Grime's Graves, showing various layers of in-filling. P.S.E.A.



## THE NEOLITHIC PERIOD IN EAST ANGLIA

the ancient workmen at the mouth of one of the galleries in the second pit opened. It was evidently the custom to haul the excavated flint to the surface, and there, at the side of the pit, to flake it into implements, as a large number of such workshop floors have been found in the Grime's Graves area. No polished flint was found during the diggings, and though these revealed several implements of celt-like form (Fig. 64)

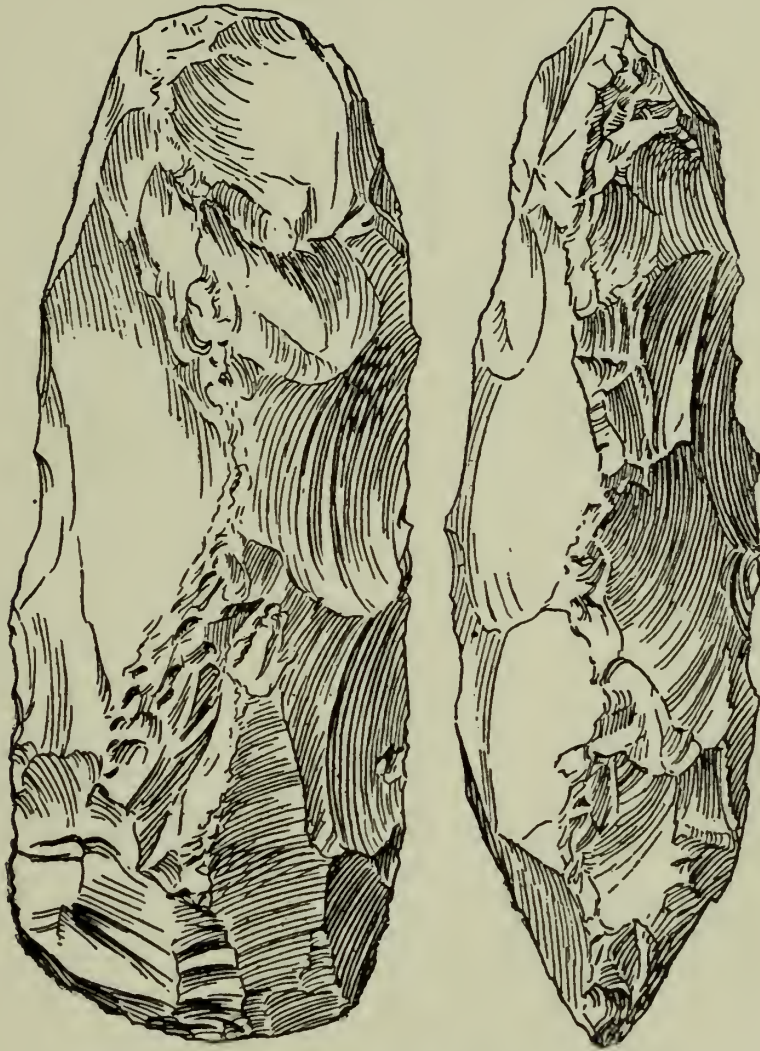


Fig. 64. Implement of celt-like form from pit at Grime's Graves. ( $\times \frac{2}{3}$ ) *P.S.E.A.*

such as are usually regarded as of Neolithic age, the overwhelming majority of the specimens are of earlier types. It is, in fact, true to say that Grime's Graves, far from being a site where flint implements of Neolithic form were made, was a place where the prevailing custom was to flake nodules into the shape of tortoise cores, of Mousterian, Palaeolithic type, and to strike off flake implements from them (Fig. 65). Forms other than flake implements were found, comprising hand-axes (Fig. 66), scrapers of various kinds (Fig. 67), conical planes,



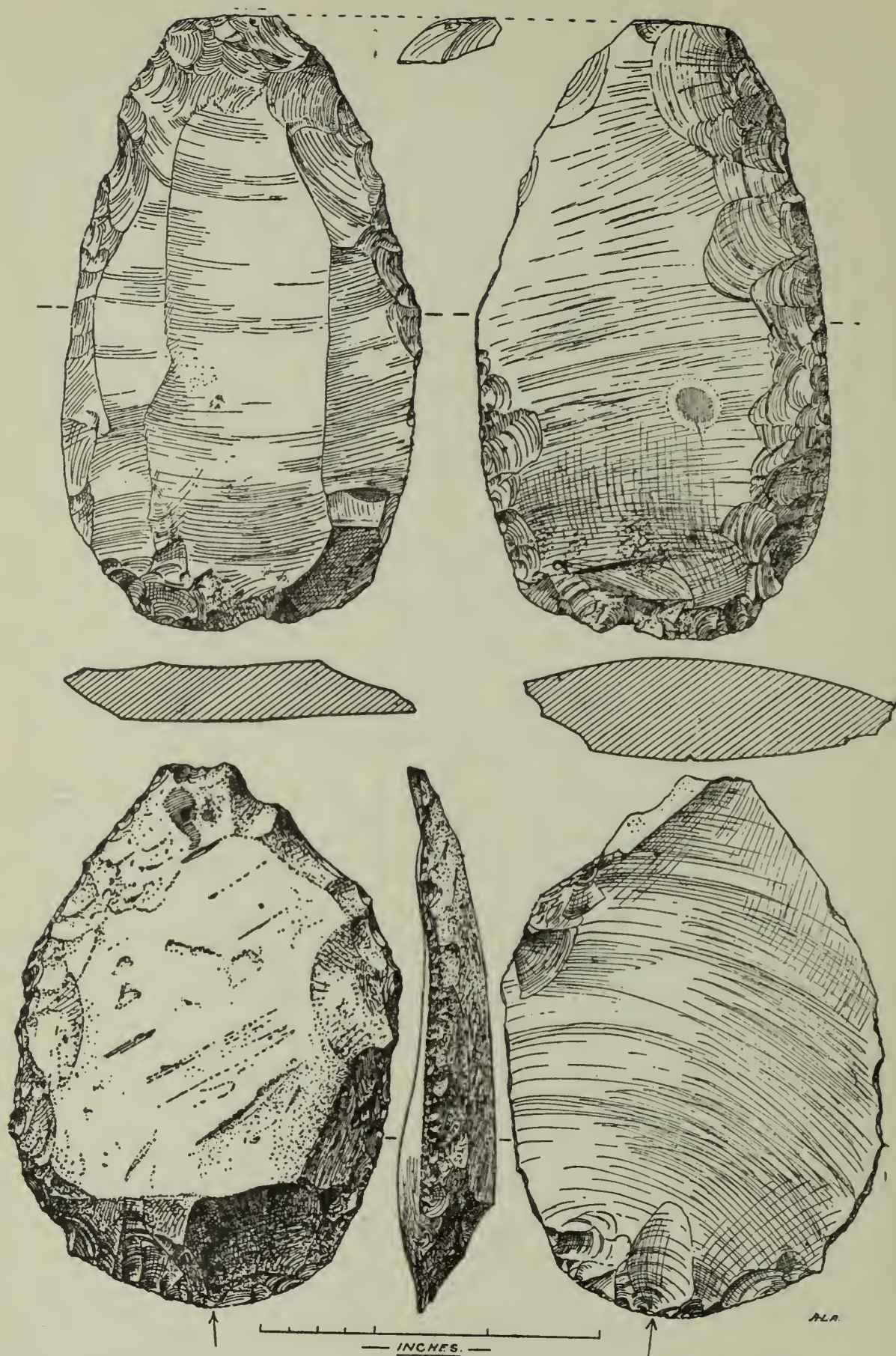


Fig. 65. Flake implements from a workshop floor at Grime's Graves. *P.S.E.A.*



## THE NEOLITHIC PERIOD IN EAST ANGLIA

knives with blunted backs, side scrapers and points (Fig. 68), but many of these, both in their forms and in the manner in

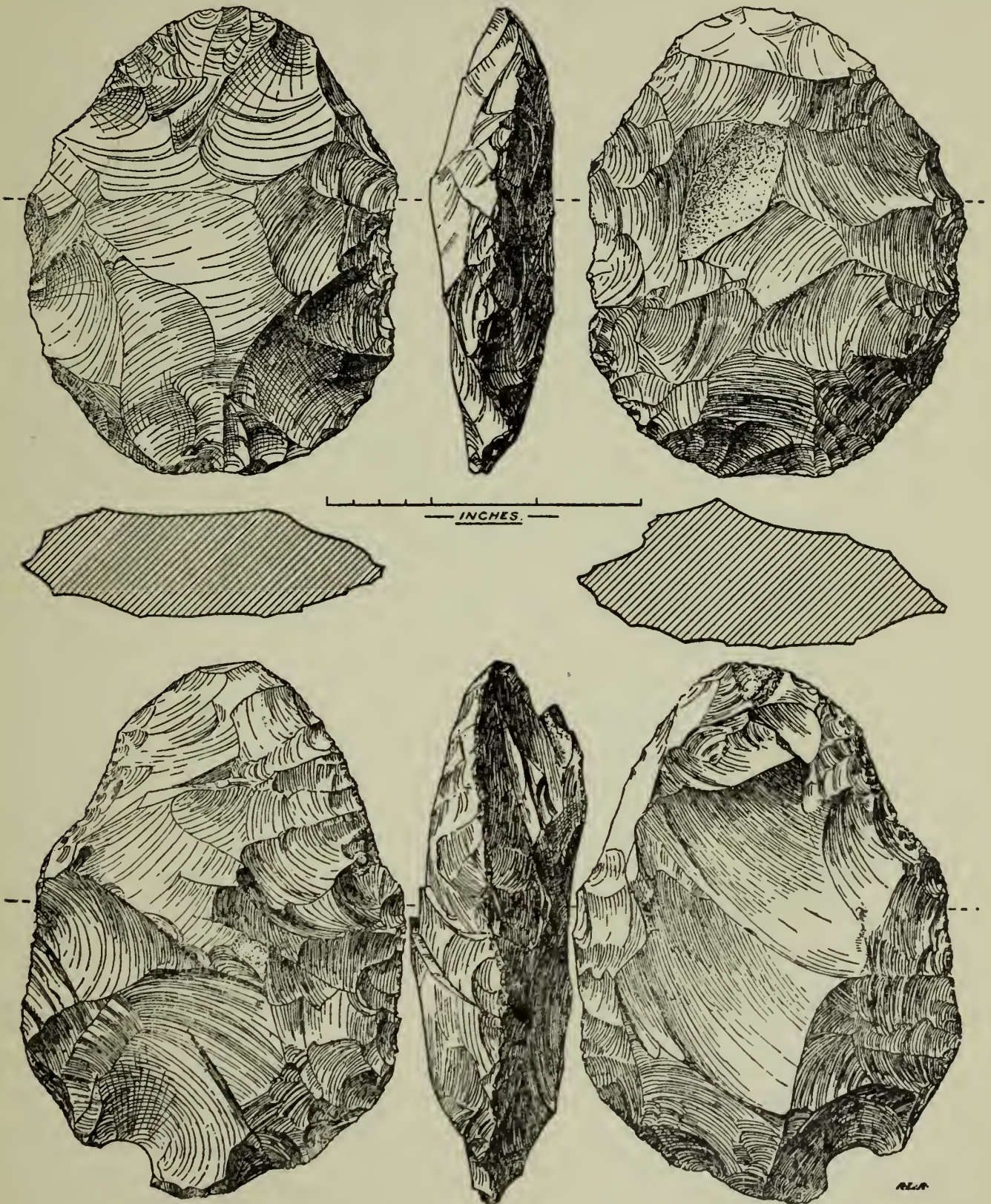


Fig. 66. Ovate hand-axes from a workshop floor at Grime's Graves. *P.S.E.A.*

which they are flaked, are very reminiscent of those of Palaeolithic times. But these flint implements are found associated with an elaborate system of mining, bones of the red deer, roe deer, long-faced ox, horse, dog, fox, pig, and sheep, but



## THE NEOLITHIC PERIOD IN EAST ANGLIA

no extinct animals, and it is not generally supposed that Palaeolithic man mined for flint, and had as his associates a series of "modern" animals. The discoveries that have perhaps

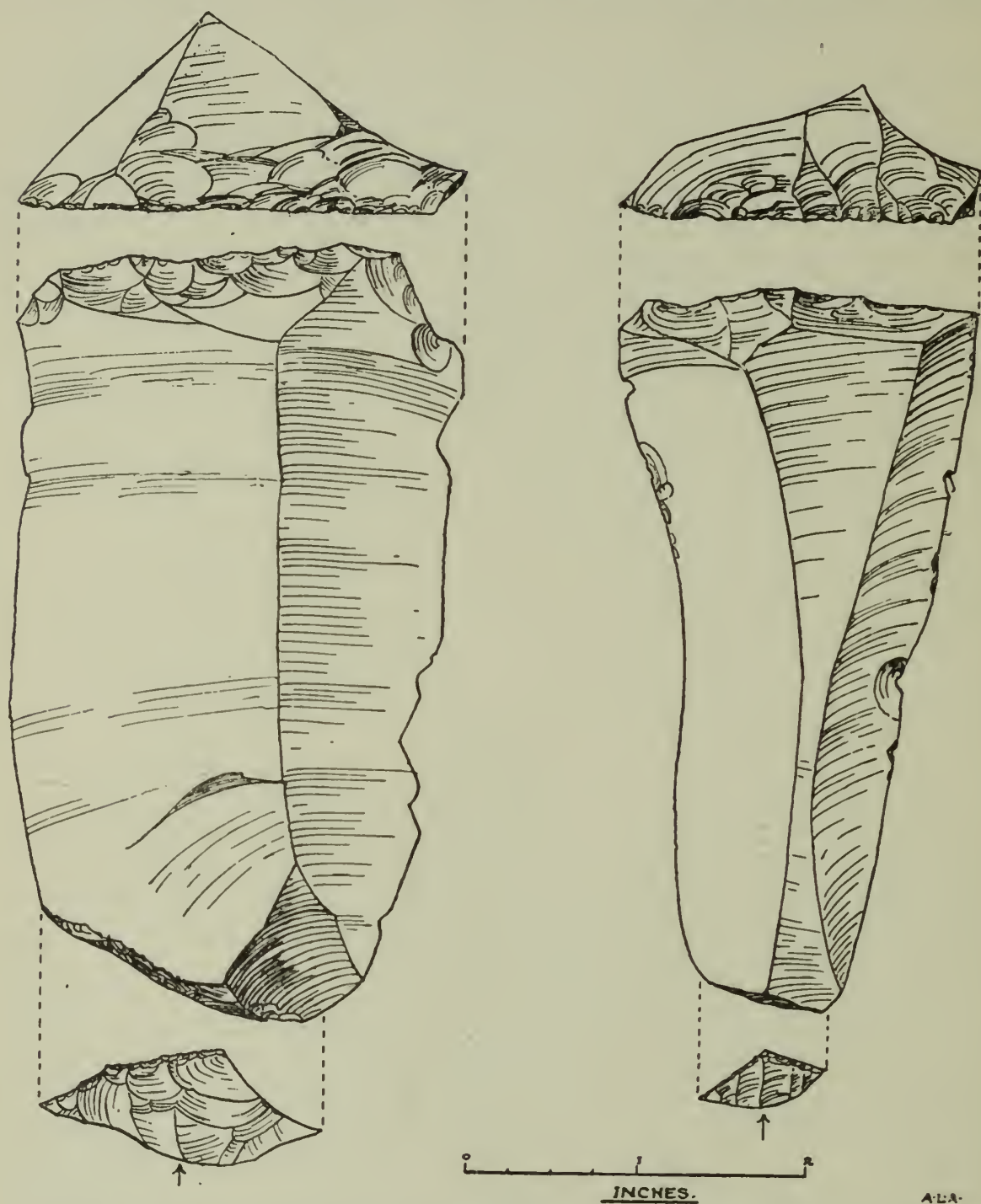


Fig. 67. Two scrapers from a workshop floor at Grime's Graves. *P.S.E.A.*

thrown the greatest amount of light on the Grime's Graves problem, are those made in recent years by Mr Leslie Armstrong.<sup>1</sup> By a very careful examination of some of the ancient floors at this site, Mr Armstrong has found that two periods of flint implement-making are represented. The specimens of

<sup>1</sup> Armstrong, A. L., *Proc. P.S.E.A.* vol. III, pt 3, p. 434.



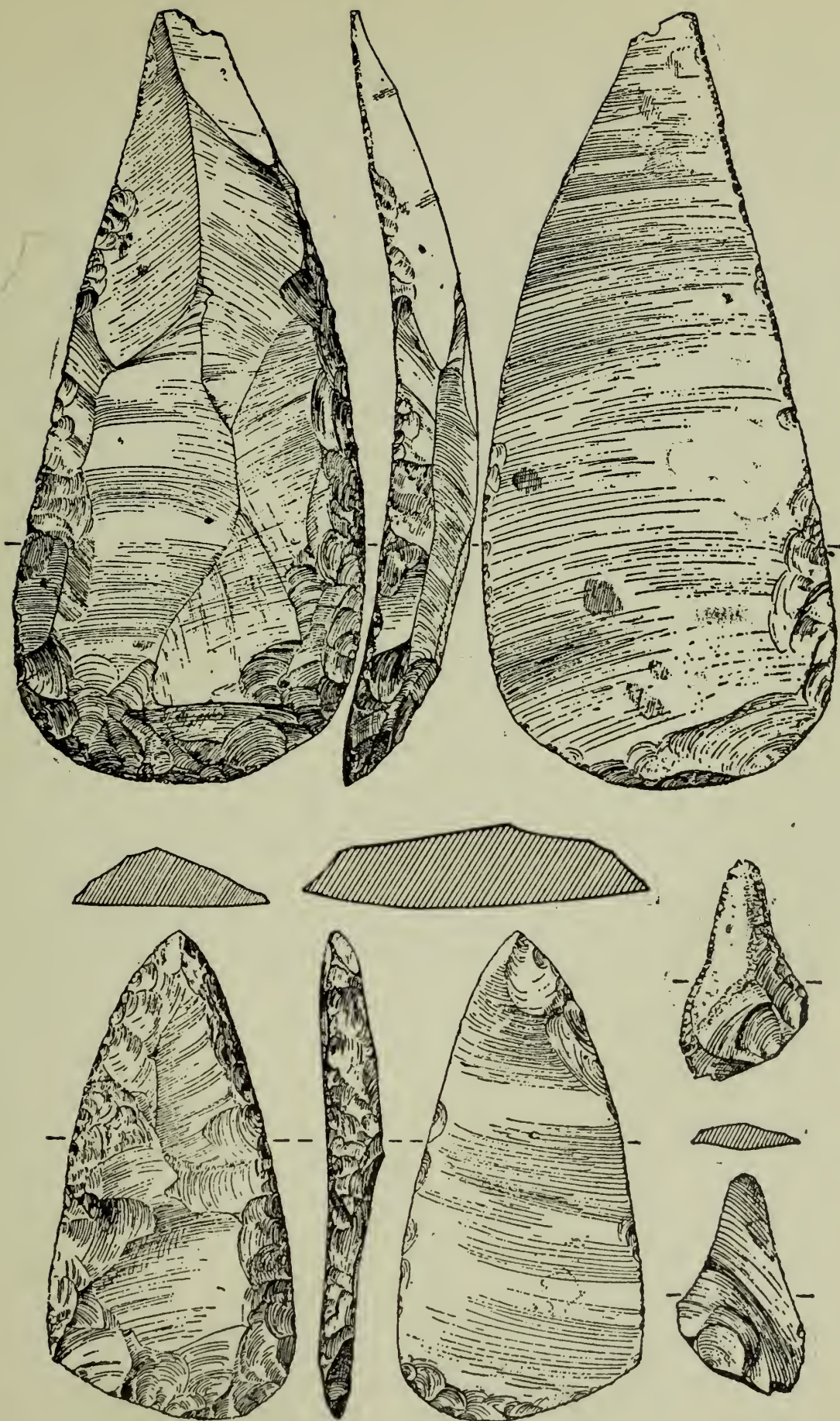


Fig. 68. Side-scraper and pointed implements from a workshop floor at Grime's Graves. (Reduced about  $\frac{1}{2}$ .) *P.S.E.A.*



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the older level are exclusively of Palaeolithic forms, such as are usually found in deposits of Later Mousterian age, while the later horizon yields implements more closely allied to those of the Neolithic period (Fig. 69). Artifacts of the Bronze, Iron, and Roman ages, are also found at Grime's Graves, but these are definitely later than the older industries in flint. If it is indeed a fact that the oldest flint implements of this site are of Mousterian age, then we must recognise that Palaeolithic man mined for flint, a not improbable occurrence when the type of flint, certainly not derived from gravel, from which many of his implements are made is considered. But the



Fig. 69. Section showing superimposed floors at Grime's Graves. P.S.E.A.

matter is still further complicated by the discovery first brought to notice by Dr A. E. Peake<sup>1</sup> of a series of flints, of which the outside cortex, or crust, bears what are evidently lines and drawings of animals made by man. The most interesting of these is the outline of an elk or a red deer, discovered by Mr Armstrong in the most ancient level at Grime's Graves (Plate XIX).<sup>2</sup> In association with this unique specimen have been found others upon which the heads of various creatures are incised. A number of such works of art, executed by a suitably shaped *burin*, or graver, have been found in Upper Palaeolithic deposits in France, but never before in association with flint implements of Mousterian type. The earliest evidence of art upon the Continent has been found in the Aurignacian period, which succeeded the Mousterian, and if the Grime's Graves implements of the Lower Level are indeed

<sup>1</sup> Peake, A. E., *Proc. P.S.E.A.* vol. II, pt 3, p. 276.

<sup>2</sup> Armstrong, A. L., *Proc. P.S.E.A.* vol. III, pt 3, pp. 434-443.





ENGRAVED OUTLINES OF ANIMALS ON THE CRUST OF A FLINT  
from a workshop floor at Grime's Graves. *P.S.E.A.*





of the latter epoch, then it will be necessary to recognise that these Norfolk drawings are the most ancient of their kind hitherto discovered. The discovery of such drawings referable to pre-Aurignacian days is not altogether impossible, because those assigned to the Aurignacian period are, in some cases, remarkably well executed and cannot, it would be supposed, represent man's first artistic efforts. Another problem which confronts those who have investigated Grime's Graves is to understand how it was that these ancient people should be able to know that, at a depth of 30 feet from the surface of the ground, there existed a vein of flint eminently suitable for their requirements. At this place, however, there exists a valley, now dry, that runs close to the high ground where the flint mines are situated, and it occurred to me that if the sought-for layer of flint is horizontal it would outcrop somewhere in the sides of this valley. I therefore suggested to Mr Armstrong that it was, probably, there that the ancient hunters first found the flint they needed, and having done so, followed it up by sinking pits down to 30 feet in depth on the high ground. Acting upon this suggestion, Mr Armstrong has carried out excavations in this valley with most interesting results, for he has found there a series of archaic pits covered by a definite layer of pure sand, of which the form and method of working are, without question, much more primitive than that of those at a higher level.<sup>1</sup>

Thus, these newly discovered shafts are smaller and less symmetrical than the later excavations, and were dug by means of pieces of bone held in the hand and used as picks, while the more experienced miners utilised the antlers of the red deer for this purpose. Further, the system of galleries radiating from the base of the main shaft, which is such a marked feature of the later pits, is almost entirely absent in the earlier examples, the bottoms of which are merely belled out in order to follow up the vein of flint as far as possible (Fig. 70). The implements recovered from these ancient mines, ingress and egress from which was by means of very rough steps cut in the chalk sides, are not very numerous, but are chiefly of Palaeolithic types, and comparable with those found in the older of the Grime's Graves floors mentioned above.

<sup>1</sup> Armstrong, A. L., *Proc. P.S.E.A.* vol. IV, pt 1, pp. 113-125 and vol. IV, pt 2, pp. 182-190.



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Thus, it would appear highly probable that the earliest miners of Grime's Graves began their operations in the valley adjoining the site of the main workings, and that in this valley will be found the genesis of the whole industry. Similar flint mines to those at Grime's Graves have been found in the chalk at Cissbury near Worthing, and at Spiennes in Belgium, while at other places implements corresponding in type to those

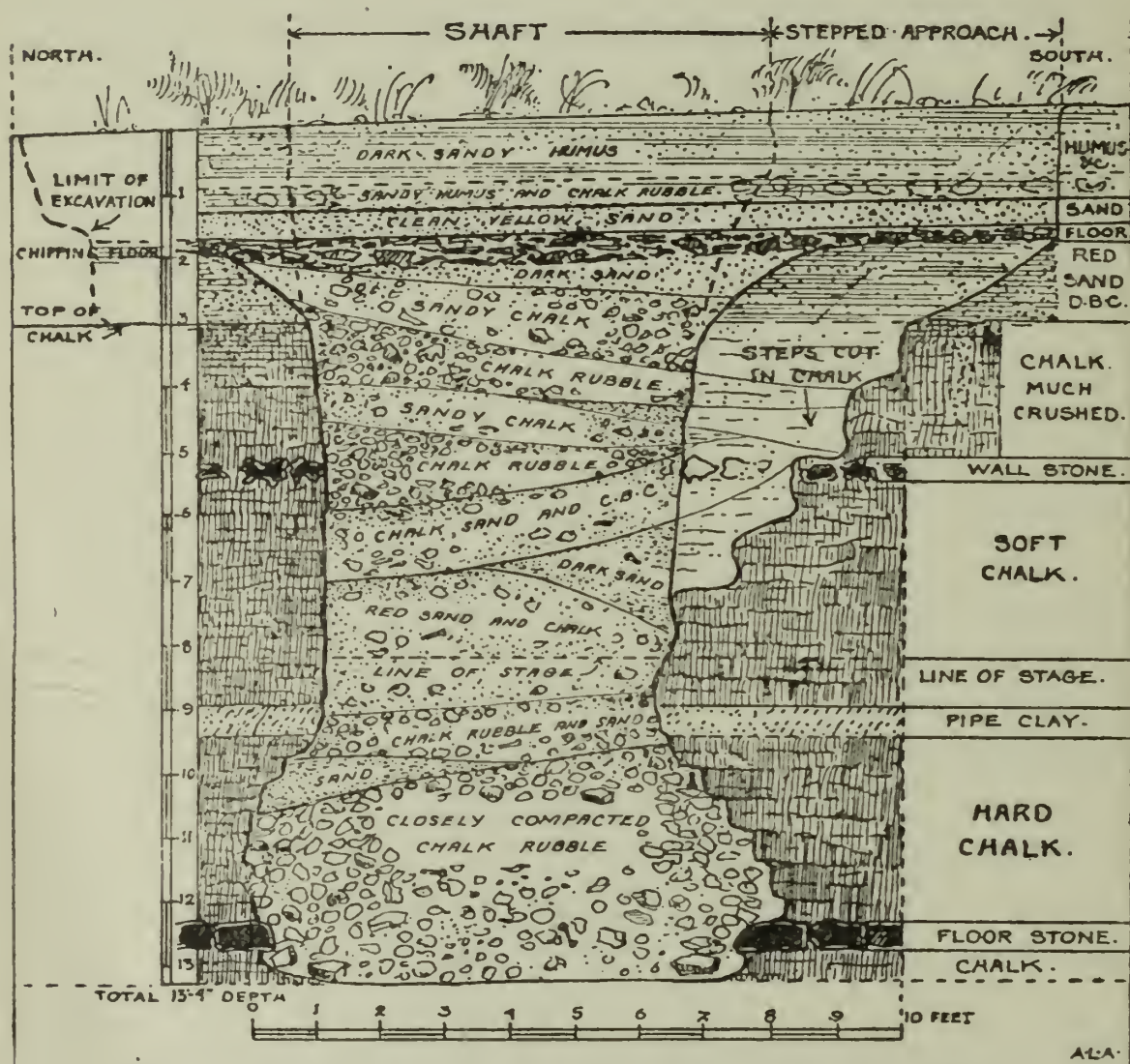


Fig. 70. Section of Archaic Pit with various layers of in-filling at Grime's Graves. P.S.E.A.

found at these sites have been found scattered over small areas upon the surface of the ground.

As regards the animal bones actually associated with the Grime's Graves implements, Mr Armstrong has pointed out that only the remains of horse and red deer have, so far, been found, and that the other mammalian remains discovered are not contemporary with the flint industries at this place. It



seems to follow, from Mr Armstrong's researches, that Grime's Graves was exploited for flint by various prehistoric races, over a considerable length of time, and that the earliest of these people were possibly of Palaeolithic date. The examination which I have carried out of the hand-axes, side scrapers, points, and other implements from the older level at this site has convinced me that, so far as form, technique and patination are concerned, they are indistinguishable from others of known Mousterian antiquity. Future researches will no doubt show whether these characteristics are absolute evidence that such specimens were made only in this period, or whether artifacts, in every way comparable with these of Mousterian times, were again made and used in much later Neolithic days.

In addition to the very large series of implements now recovered from Grime's Graves, there are also a vast number which have been found in East Anglia, either upon the surface of the ground or in occupation-levels buried superficially beneath it, and regarded as of Neolithic date. But it must always be remembered that specimens found under these circumstances need not, necessarily, be the work of Neolithic man. Deposits of great antiquity often outcrop upon the present surface, while, in view of the fact that no marked geological changes have occurred in Suffolk and Norfolk since Upper Palaeolithic times, floors of this period would, naturally, be found sometimes buried superficially beneath that surface. All such occupation-levels merit a very careful geological and archaeological examination so that their real age may be ascertained. In 1921, Miss Layard found at Buckenham Tofts Park, Norfolk, a naturally formed mound composed of fire-fractured flints. The area over which these specimens occurred was of triangular shape, and measured 48 feet by 42 feet by 54 feet. It is supposed that the site represents a kind of communal kitchen where animals were cooked and eaten. Miss Layard found associated with the burnt flints some bones of the horse and ox, together with flint implements comprising scrapers, borers, and side scrapers. This interesting and important discovery, which is evidently referable to some prehistoric period, is the only one of the kind hitherto recorded from East Anglia.<sup>1</sup> The polished axes and other implements

<sup>1</sup> Layard, N. F., *Proc. P.S.E.A.* vol. III, pt 4, pp. 483-498.

of Neolithic man have been found in quantity in East Anglia, and these specimens occur usually upon sandy areas, where, it is evident, these people preferred to live. It is a remarkable fact that the great majority of the polished axes are made from grey flint, the black variety being seldom, if ever, used. The needed grey flint was no doubt recovered from the Glacial Boulder Clay which contains this variety in abundance, but why it should have been used in preference to black flint in the making of polished axes is by no means clear. In various parts of the country hoards of Neolithic axes have been found, and one of the most notable of these was discovered upon the property of Mr Russel Colman, while digging a shallow trench in the garden at Crown Point House, Whitlingham, near Norwich.<sup>1</sup> This hoard consisted of five very fine chipped axes, showing no signs of having been used, and which, by the similarity of the specimens to each other, are supposed to have all been the work of one craftsman. These axes, the biggest of which is 9 inches in length, are evidently referable to Late Neolithic times. No less than three other hoards of Neolithic axes have been found in Norfolk, viz. at Egmere, Hockham, and Flegg Burgh, near Yarmouth.<sup>2</sup> Large numbers of arrow-heads have been found in East Anglia and, while the leaf-shaped form is now regarded as typical of the Neolithic period, the barbed and tanged variety is supposed to have been made in the succeeding Bronze Age, but there is reason to believe that some of the less beautifully made examples of the latter type are of pre-Bronze Age date. Though Neolithic implements are so numerous in East Anglia, thus showing that the area was well populated in this period, yet the well-known burial mounds, the long barrows, of the Neolithic people are, so far as my knowledge extends, unknown in Suffolk and Norfolk. The climate of Neolithic times was probably moister than that of East Anglia to-day, but otherwise there has been very little change in climate or in geological conditions since these days, the heavy lands being covered by dense scrub and forest, while the open, sandy, country was much as it is to-day. The animals associated with Neolithic man were, among others, the brown bear, wolf, horse, various kinds of deer and oxen, sheep,

<sup>1</sup> *Summary of Proc. P.S.E.A.* vol. I, pt I, p. III.

<sup>2</sup> Smith, R. A., *Archaeologia*, vol. LXXI, 1921.



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goat, pig, and dog, and some of these were without much question domesticated.

The Neolithic people who practised a rudimentary agriculture had learnt also how to hollow out the trunk of a tree, and so to make a primitive boat; the remains of such a "dug out," as it is called, were found in the estuary of the Orwell some years ago and are now preserved in the Natural History Museum, High Street, Ipswich. Large numbers of

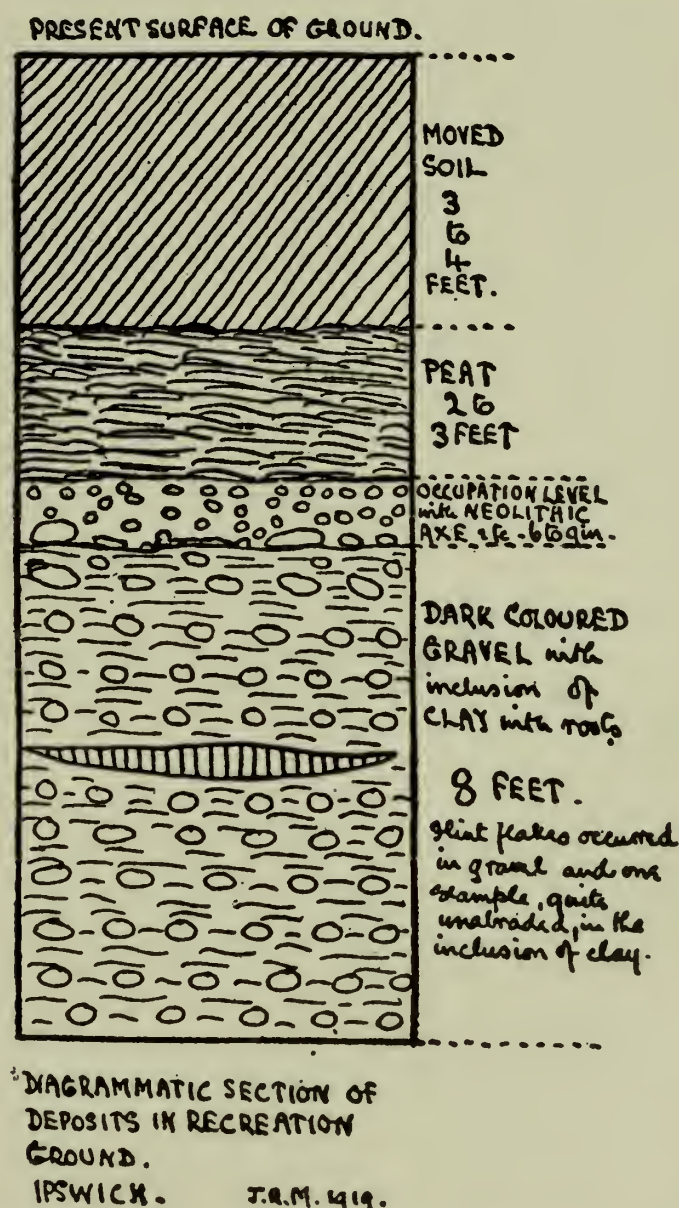


Fig. 71. Section in Recreation Ground, Ipswich. *Man.*

flint implements, many of which may be of Neolithic age, found upon the surface of the ground in north-west Suffolk and elsewhere, exhibit upon their flaked surfaces very clearly-defined scratches, similar to those imposed by the action of moving ice in glacial times. The late Dr Sturge was the first to draw attention to these scratched flints from the surface,

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and put forward the theory that they were imposed during successive minor glaciations occurring in Neolithic times.<sup>1</sup> Apart, however, from the lack of geological evidence in support of this claim, a number of experiments which I have carried out showed that patinated flint can be scratched by steel, thus making it probable that the scratches upon Dr Sturge's specimens had been imposed by agricultural implements, such as harrows or ploughs.<sup>2</sup> I was able to show that the surface of a patinated

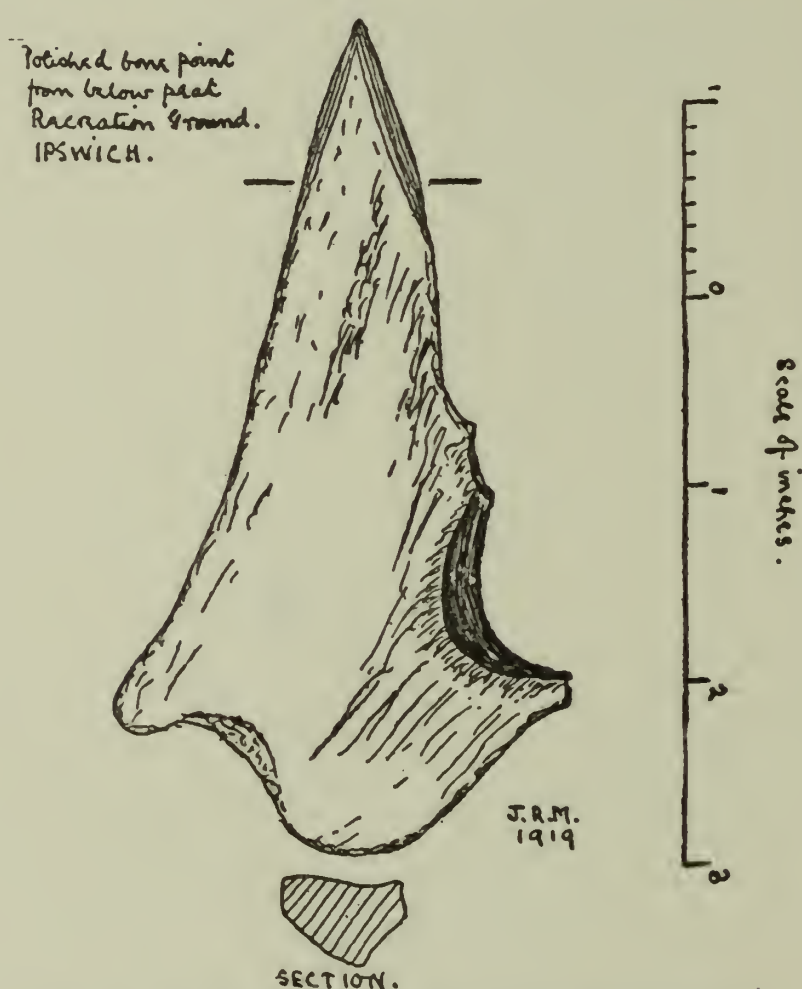


Fig. 72. Bone implement found in Neolithic floor in Recreation Ground, Ipswich. *Man.*

flint was much softer than the surface of an unpatinated example, and that this softness varied with the degree of patination. My experiments demonstrated also that when the agent of striation, whatever it may be, passed over a flint, under pressure, the specimen is superficially shattered along the line of movement. This shattering gives rise to the formation of a number of very

<sup>1</sup> Sturge, W. A., *Proc. P.S.E.A.* vol. 1, pt 3, pp. 254-296.

<sup>2</sup> Moir, J. Reid, *Science Progress* No. 44, April 1917, pp. 597-603.



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thin plates of flint which in the course of time, by reason of atmospheric changes, weather out, so that eventually a well-marked groove is formed in the surface of the stone. Thus, such grooves do not indicate that they were formed under great pressure by the agent of striation, but that they are the end product of long-continued thermal and other changes acting upon a shattered area in the surface of the flint. In this matter of the scratches exhibited by flint implements upon the surface of the ground, it is of interest to note that pieces of bottle glass found on ploughed fields often show a large number of scratches, of different types, upon their surfaces, and these markings have without much doubt been imposed by agricultural implements in movement. As already mentioned (p. 105), I found an Early Neolithic floor under 2 or 3 feet of peat, and resting upon gravel in the Recreation Ground, Ipswich (Figs. 71, 72 and 73).

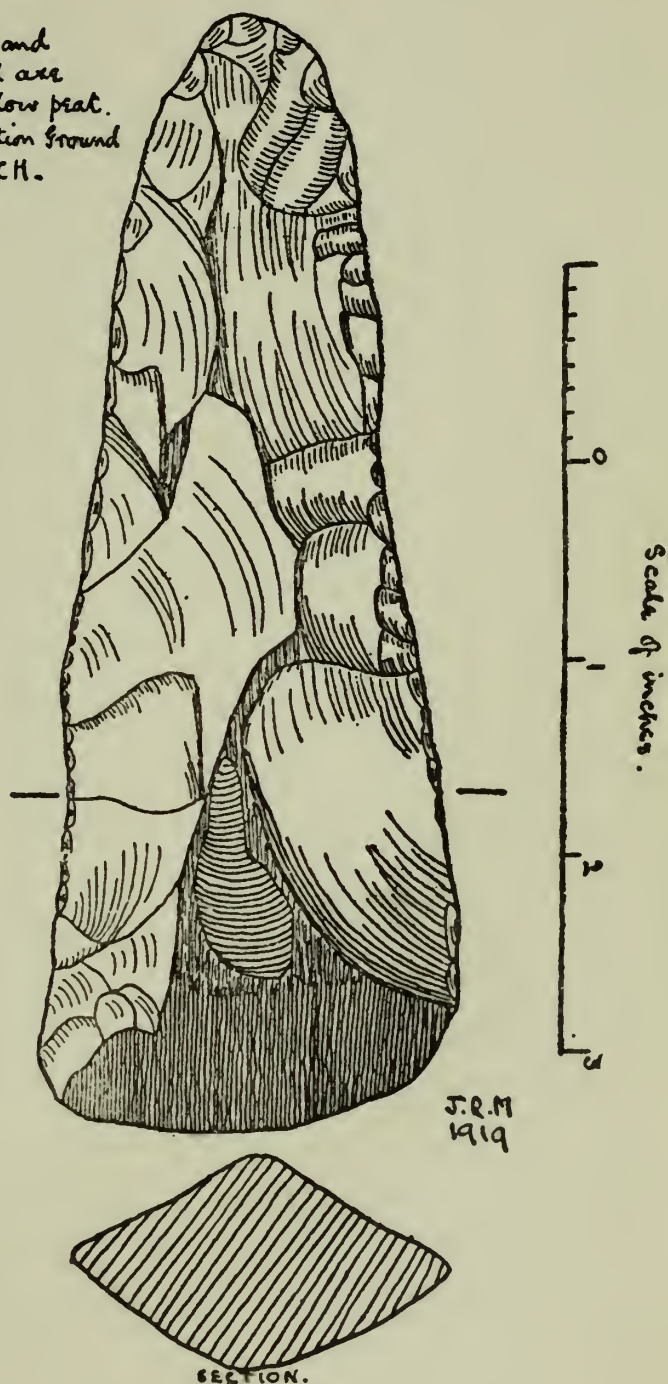


Fig. 73. Neolithic axe found in Recreation Ground, Ipswich. *Man.*

## CHAPTER XII

### *The Bronze Age and Later Races in East Anglia*

ABOUT four miles to the east of Ipswich, and not far from the estuary of the River Deben, there exists a portion of the plateau which is very wide and level. It forms part of the sand belt that borders Suffolk on the seaward side, and is a place of gorse and heather, where many of the birds of the East Anglian heathlands find a congenial home. To-day Martlesham Heath, or more correctly Brightwell Heath, has somewhat lost its former wildness and solitude, for large aerodromes have been erected there; but, as a contrast to this modernity, there are to be seen, scattered about on certain parts of the plain, a number of round barrows, or tumuli, that mark the burial places of an ancient and long-forgotten people. Such grave mounds are by no means rare in Suffolk and Norfolk, and most of them were built, in all probability, during the Bronze Age by invaders who came across the North Sea. In the successive invasions to which in the past this country has been subjected by westward migrating Continental people, the east coast had naturally to bear the brunt, and this may in a measure account for the great richness of this area in prehistoric remains. It may also be that the independence and love of freedom of the people of the Eastern Counties had its origin in the far-off days, when the call to defend their homes and liberty against alien marauders must have been of frequent and desperate insistency.

Though the shape and appearance of the majority of the tumuli on Brightwell Heath suggest that they are of Bronze Age date, yet for some unknown reason these mounds have been associated in the minds of some antiquarians with the Danes, who, at successive times, invaded and plundered East Anglia. It is supposed that the last engagement in this part of the country with these people took place on a neighbouring heath at Rushmere, and that the Martlesham tumuli may be attributed to this battle. With a view to attempt to elucidate this problem, the Ipswich and District Field Club (now the Ipswich and District Natural History Society) undertook the



excavation of some of the mounds at Brightwell, and this work resulted in the accumulation of some very interesting facts regarding them.<sup>1</sup> The diggings were under my control, and I was fortunate in having the valuable assistance of Miss Nina Layard, F.S.A., Miss Outram, Mr W. B. Nichols, and the late Mr E. T. Lingwood. It was decided to open two tumuli, in close contiguity to each other, and the bigger was first attacked (Plate XX, 1). A trench was driven through the mound, and showed that the ancient people, in constructing this tumulus, first of all excavated to a depth of about 18 inches the whole area enclosed by the outer edge of the surrounding fosse or ditch, and that this ditch had been dug to a level 6 to 9 inches lower than that upon which the mound stands.

Having accomplished this, the remains of the dead were placed either in or upon the centre of the surface of the



Fig. 74. Flint scrapers found in tumulus on Brightwell Heath, Suffolk.  
(Nat. size.)

excavated area, a large number of flint scrapers, flakes, etc. (Fig. 74) were scattered around and perhaps over the interment, and earth, including, no doubt, the material excavated in the preparation of the site, piled over the whole in the form of a low, round mound. A large fire then appears to have been lighted upon the surface of the tumulus, and this, it seems, concluded the funerary ceremonies so far as the actual process of burying was concerned.

There would seem little doubt that cremation was sometimes practised at this period, as no human bones were discovered in the excavation, but some fragments of pottery were found, with the flints already mentioned, in the centre of the mound, and this pottery is clearly by its ornamentation referable to Early Bronze Age times, about 1400 to 1100 B.C. The presence of flint implements in considerable numbers in an interment of

<sup>1</sup> Moir, J. Reid, *Journ. Ips. and Dis. Field Club*, vol. VI, June 1921, pp. 1-14.

the Bronze Age, when metals were in general use, is of much interest, and would seem to show that such specimens were already regarded by these people as possessing some mystic qualities, and had taken a definite part in the cult of the dead.

The investigation of the other small tumulus revealed even more interesting results. During the excavation of the exploration trench the discovery was made of a bucket-shaped bronze bowl,  $8\frac{3}{4}$  inches wide at the mouth and  $5\frac{1}{4}$  inches high, containing the cremated remains of human beings and animals, together with a small series of dateable cultural objects (Plate XX, 2). The bowl, which is made of very thin, beaten bronze, of an extreme fragility, rested upon the surface of the undisturbed sand underlying the tumulus, and when at first uncovered appeared to be more or less intact. But a closer examination revealed the fact that a rabbit had burrowed right through the bowl, and had broken it to a considerable extent. It is evident that the vessel was, when complete, of a pleasing and artistic form and possessed, attached to two lugs, an arched handle, which, in the course of centuries, has disappeared. The form of this bowl, and the nature of the objects it contained, indicate that this tumulus was built by Pagan Saxons, about 460 A.D., then living in that part of the country. These bowls were used for various purposes in Saxon times, and in this case as a cinerary urn. The vessel even now bears upon portions of its surface pieces of linen, and as this linen was found to be tied round the neck of the vessel by means of some sort of "string," it appears that, after the cremation, the bones and certain ornaments were placed in the urn, which was then tied up in a similar manner to that in which modern jam-jars are treated. The burnt bones found in the bowl included fragments of an adult human skeleton, portions of the skull of a newly-born child, part of a woman's skull, and other fragments, evidently of a foetal skull. Altogether it appears that four individuals are represented, and their remains were accompanied by the remains of a small ox and the lower end of the femur of a dog. With these relics were found an almost complete bone comb with iron rivets (Plate XXI) and fragments of another similar ornament; a bone disc, with different ornamentation on the two sides; the remains of a circular bracelet of ivory, warped and twisted by





(1) VIEW OF TUMULUS ON BRIGHTWELL HEATH, SUFFOLK

*Ips. and Dis. Nat. His. Soc.*



(2) RECONSTRUCTED BRONZE BOWL OF ANGLO-SAXON AGE  
found in small Tumulus on Brightwell Heath, Suffolk

*Ips. and Dis. Nat. His. Soc.*

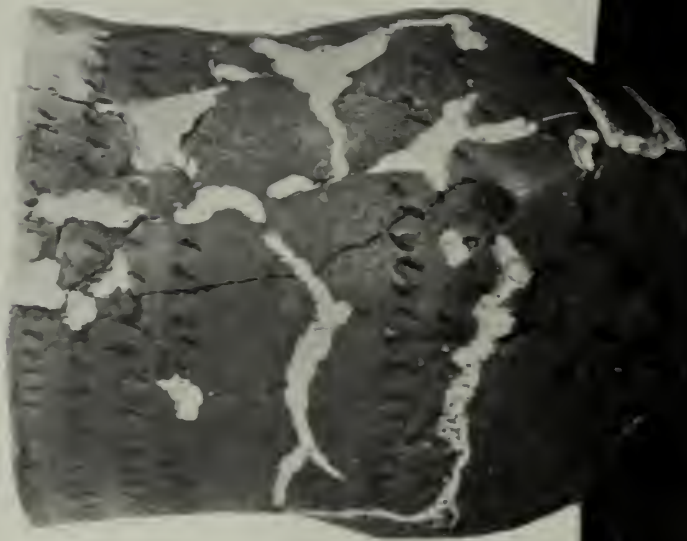
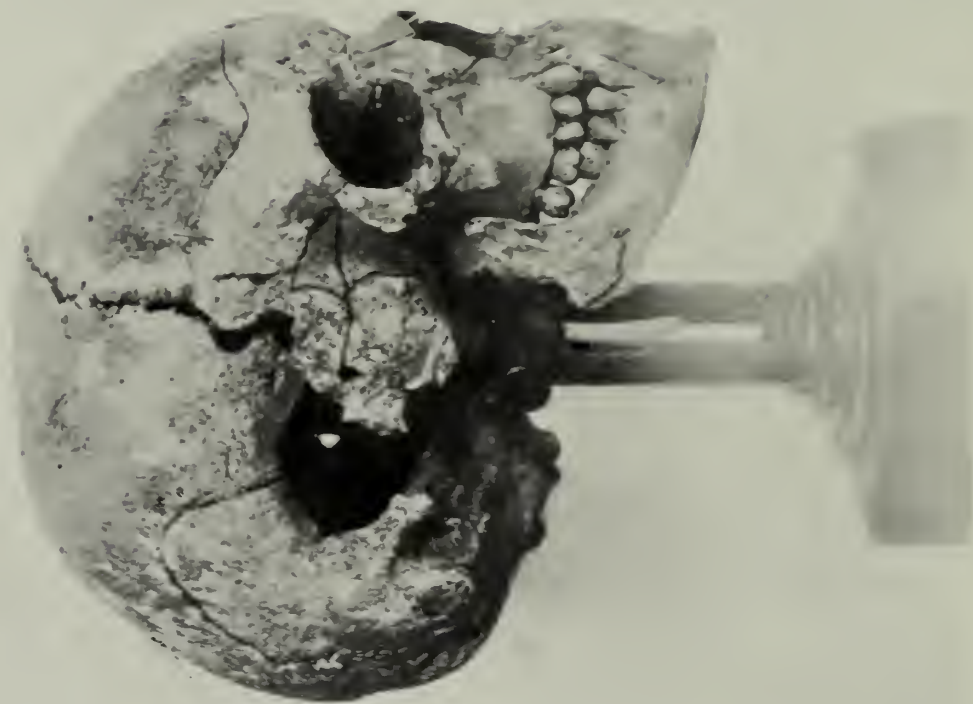


BONE COMB, WITH IRON RIVETS, OF ANGLO-SAXON AGE  
found in small Tumulus on Brightwell Heath, Suffolk. (Nat. size)

*Ips. and Dis. Nat. His. Soc.*







SKULL OF NEOLITHIC, OR LATE BRONZE AGE, YOUTH, AND ZONED BEAKER BURIED WITH HIM  
found at Thorington Hall, Wherstead, Ipswich. *Man*



fire; two glass beads, and an object in clay made in a mould, and probably meant to represent a draughtsman.

The whole circumstances of this find make it clear that the various relics discovered are similar to those found in burials in N.W. Germany, Schlesvig Holstein, and Denmark, and there would seem no doubt that we are dealing with one of the interments of invading people from the Continent. The close association of tumuli referable to the Bronze Age and to Pagan Saxon times is not surprising, and has been noted in other districts. It would seem by the number of burial mounds at and in the neighbourhood of Martlesham, that a considerable population must have dwelt there at these periods, and it is hoped that an examination of other of these tumuli may be undertaken at some future date.

Remains of the Bronze Age in the shape of implements, pottery, and burial mounds have been found over wide areas in East Anglia.<sup>1</sup> The earlier portion of this period, when the dead were usually buried unburnt, is represented in the northern district of Ipswich by the discovery of pottery vessels, known as Zoned Beakers because of the zones of decoration which they exhibit. Food was put in these and the vessels buried with the deceased, so that he might not go hungry in the next world. An example of such a burial was found in my excavations in the Red Crag at Thorington Hall, Wherstead, near Ipswich.<sup>2</sup> The skeleton, which was buried in the contracted posture with knees drawn up towards the chin, was found at a depth of 6 feet from the surface of the ground. The grave had evidently been dug through a very hard loam into the underlying Crag, and the body lay on its back with the face turned towards the west, while on the right-hand side of the remains were pieces of a Zoned Beaker, which had been placed with the deceased. The bones are those of a boy between 12 and 14 years of age, who lived at the end of the Neolithic period or the beginning of the Age of Bronze. He was about 4 feet in height, and possessed a skull slightly longer, narrower, and higher than is common in England to-day (Plate XXII). Towards the later part of the Bronze Age cremation was practised, the burnt remains of the dead being placed in large

<sup>1</sup> See Evans, *Ancient Bronze Implements of Great Britain*.

<sup>2</sup> Moir, J. Reid, *Man*, vol. xvi, No. 7, pp. 97-98.

bucket-shaped cinerary urns ornamented with thumb-mark decoration (Plate XXIII, 1). Urns of this type have been found on the north side of Hadleigh Road, Ipswich,<sup>1</sup> and a larger burial field of this age has been discovered recently upon the property of Mr John Keeble of Brantham, near the southern boundary of Suffolk. Bronze implements, consisting of beautifully made swords, axes, and palstaves, have been found in East Anglia, and a very rare type of dagger was discovered at Sproughton, Suffolk, and is now in the British Museum. Though at this period bronze had largely superseded flint for implement making, yet there is no doubt that this latter material was still in use for this purpose. In fact some of the most beautiful flint implements known, and in a measure rivalling the much earlier Solutrean blades both in form and flaking, were made in Early Bronze Age times. Again, the discovery of flint implements in a tumulus of this period, on Brightwell Heath, Suffolk, affords further evidence in this direction, but in this case it would appear that the specimens there found were placed over the interment as part of the funerary ceremony, pointing to the conclusion that flint implements had already begun to have a magic value to the Bronze Age people. In the instance above quoted it was clear, from the unabraded and quite fresh condition of the flaked flints, that they were actually made at the time for ceremonial purposes, and are indeed of Bronze Age date. But, in the case of some flint implements found in tumuli and other burials, the specimens are sometimes patinated and abraded, and are obviously much more ancient than the period to which the burial is to be referred.

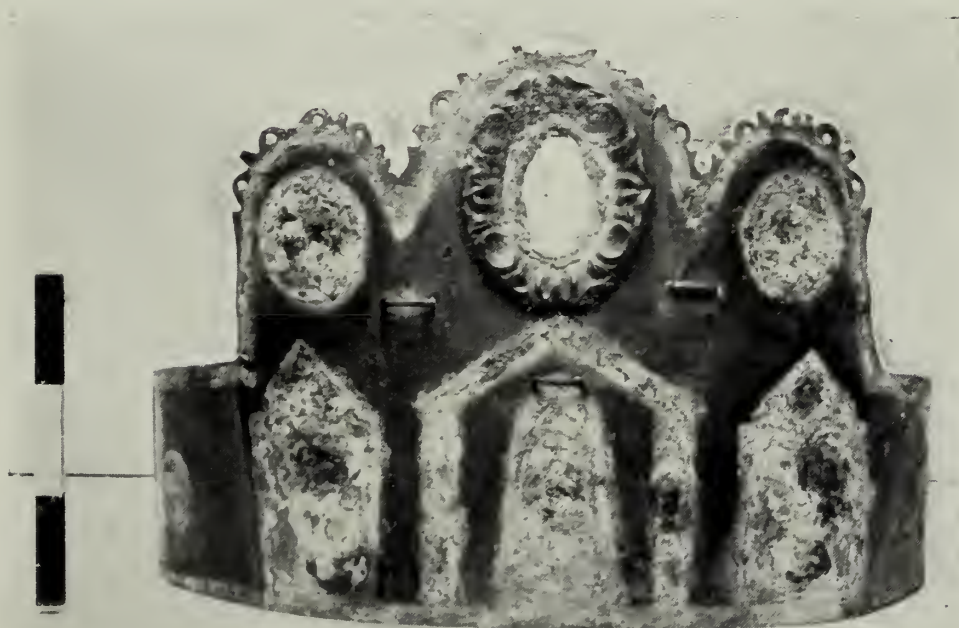
Though remains of the succeeding Iron Age have been found in a few places in Suffolk and in Norfolk, it cannot be said that, so far as we know at present, East Anglia is very rich in vestiges of this period. Recently, however, a cemetery of Late Iron Age date has been found at Boxford on the southern border of Suffolk, where a considerable number of typical urns, containing the cremated remains of the dead, have come to light. It is to be hoped that this find may be the forerunner of others in East Anglia, where it seems Iron Age relics should be as numerous as in other parts of England.

<sup>1</sup> Moir, J. Reid, *Man*, vol. XIX, No. 1, pp. 6-7.





(1) LATE BRONZE AGE BURIAL URN  
found at Brantham, Suffolk. *Man.*



(2) BRONZE CROWN OF EARLY ROMAN AGE  
found at Cavenham, Suffolk. *A. J.*



URN AND BRONZE BUCKLE OF LATE ROMAN AGE  
found in burial ground in Messrs Bolton and Co.'s brickfield, Ipswich. *Man.*



The Romans, who arrived in Britain during the Iron Age (55–54 B.C.), occupied the country for about 400 years, and have left many signs of their former presence in East Anglia. It is not possible in this volume, which deals primarily with Stone Age man, to give details of the discoveries of Roman antiquities in Suffolk and Norfolk, but some of the most important must be mentioned briefly.

In 1795, a bronze statuette of the Emperor Nero, 22 inches high, was found at Barking Hall, Suffolk, and is now preserved in the British Museum, Bloomsbury.<sup>1</sup> The details of the costume and armour are Roman, and the cuirass is richly ornamented with inlaid patterns in silver and niello.

Another remarkable discovery described by Miss Nina Layard was made at Cavenham, near Bury St Edmunds, of two Roman bronze crowns (Plate XXIII, 2) and a head-dress which were used evidently for ceremonial, or religious, purposes.<sup>2</sup> At the place where these important specimens were found, Miss Layard carried out diggings, and discovered numerous fragments of pottery of the Early Roman period, together with a beautifully made bronze feather used as a decoration for one of the crowns. These latter relics are unique in England and, thanks to the generosity of Miss Layard, now form a permanent and valued part of the collections in the Ipswich Museum. On the right-hand side of the Norwich Road, leading out of Ipswich, is a place called Castle Hill, now a private residence, where there exists the remains of a Roman villa. At this spot have been discovered some excellently preserved tessellated pavement, and a large amphora, or wine vessel, which was said to contain coins when discovered by the workmen engaged in digging a hole at Castle Hill. About a quarter of a mile to the south-east is the brickfield of Messrs Bolton and Co., and on the north side of the small valley in which the works are situated an extensive Roman cemetery was discovered, which I was able to investigate.<sup>3</sup> It is evident that the villa at Castle Hill, which is supposed to have been the residence of important officials who acted as supervisors and tax gatherers for the surrounding district, was occupied

<sup>1</sup> *Guide to the Antiquities of Roman Britain* (British Museum), p. 87.

<sup>2</sup> Layard, N. F., *Antiquaries Journal*, vol. v, July 1925, No. 3, pp. 258–265.

<sup>3</sup> Moir, J. Reid, *Man*, vol. xvi, No. 7, pp. 98–100.

for a considerable space of time, as the near-by burial ground, which is obviously related to it, contains graves dating from as early as the second century to the end of the Roman occupation of this country.

The burials, which numbered upwards of 45, were placed in rows, extending from east to west, and at a depth of 3 feet to 4 feet 6 inches from the surface of the ground. It is clear that the site, which overlooks the adjacent valley, was used as a cemetery for a long space of time, as in it have been found a funerary vessel of the Bronze Age, and a portion of a very long skull and limb bones that are to be referred to some period in all probability much more ancient than the Roman epoch.

Up to about the year A.D. 250 the Romans generally cremated their dead, and often placed the ashes in glass jars which were then enclosed in wooden boxes or chests and buried in the ground. Evidence of this custom has been found at the Ipswich site, where a wonderfully preserved glass vessel, shaped like a modern "tooth tumbler," together with an elegant and well-made urn of Early Roman date were discovered with some iron nails, all that has survived of the wooden receptacle in which the remains were originally placed. Though no coins were found at this site, the majority of the relics discovered, which included some bronze bangles, must be assigned to the Late Roman period, and are of considerable interest. Some of the funerary pottery, which is generally of small size, takes the form of globular-shaped urns of hard grey ware, while several saucer-like pieces have been found, very similar to those in which modern flower-pots are often placed. One of the most attractive specimens (Plate XXIV) is a small, unique pot in grey ware very skilfully made to imitate cut glass, and found with a much decayed skeleton of an aged man. The individuals with whom these remains were discovered were buried in the normal extended position, with the hands folded across the pelvic bones, and sometimes provided with a "pillow" of surface soil upon which the head rested. It appears that these people had adopted Christianity, as, in every case, the skeletons were buried facing the east, but the presence of food vessels interred with them seems to indicate that the ancient pagan beliefs, which necessitated the provision of food







ORNAMENTS FROM ANGLO-SAXON CEMETERY, HADLEIGH ROAD, IPSWICH. S.L.A.



for the deceased in the future life, had not been entirely abandoned. The human bones and associated relics were uncovered with the greatest care, and the exact position in which these lay was ascertained with complete accuracy. It is fortunate that this was so, as otherwise the remarkable disposition of some parts of the skeletons might have been regarded as having been caused by careless excavation. For, in no fewer than five interments, the bones were all in the normal position except the skull, which was placed between the feet, and the conclusion seems to be indicated that these people had been beheaded. Though some other examples of this method of burial are known, it was by no means common at any period, and was certainly uncommon, so far as we know, in Roman times. In two of the graves mentioned some large iron nails were found, and it may be that the individuals whose remains have been discovered were criminals who were crucified and beheaded; but the skeletons are, in every case, of the female sex, and it becomes somewhat difficult to believe that out of 45 people interred in the burial ground, no fewer than five should be criminals, and these all women. The discovery is very puzzling, but it undoubtedly reveals a hitherto unknown aspect of the manners and customs of Roman times. Another unusual discovery was made in this cemetery of one of the Roman skeletons buried with a humanly flaked flint under each hand. These specimens, which are both patinated and clearly much older than the Roman period, indicate that these people knew flints shaped by man when they saw them, and that these were, in the instance mentioned, collected and placed, for some no doubt magical reason, in the hands of the deceased when burial took place. The remains of the individuals found in the cemetery at Ipswich were examined by Sir Arthur Keith, who states that they are clearly of the Roman type.<sup>1</sup> They had skulls which were long and wide, with a low, flat roof, and a wide, low forehead. The condition of the jaws and teeth, which exhibit in many cases large carious excavations, shows that their owners lived a highly civilised life, and ate cooked and prepared food. The men were about 5 feet 4 inches to 5 feet 8 inches in height, and their arm and leg bones are not of exceptional strength. Nor

<sup>1</sup> Keith, Sir A., *Man*, vol. xvi, No. 7, pp. 100-102.

did these people live to any great age, as in only one case were any remains found of a really old person. The various specimens found in the burial ground can now be examined in the Natural History Museum at Ipswich, and afford a clear indication of the type, and of the burial customs, of the inhabitants of Suffolk about sixteen hundred years ago. In 1906 a very complete and interesting discovery of a Pagan Saxon burial ground was made by Miss Nina Layard at Hadleigh Road, Ipswich,<sup>1</sup> a site now almost covered by houses. Miss Layard, to whom East Anglian archaeology owes so much, investigated no less than 159 graves of these people, and recovered from them a large number of human bones, together with iron spear-heads, knives, and shield bosses, necklaces of beads, brooches of rare Anglian type, bronze buckles, double-toothed combs, earthenware pots, glass drinking cups, and other relics (Plate XXV).

It is probable that this cemetery is of sixth century date, and more or less contemporary with the Anglo-Saxon tumulus on Martlesham Heath already described (p. 154). Anglo-Saxon remains have been found in many other parts of East Anglia, but few, if any, other places in Suffolk and Norfolk can show such a fine collection of these remains as can be seen in the Ipswich Museum. The excavations at Hadleigh Road showed that the dead were buried in the extended position with the arms close by the side. With the male skeletons were found spear-heads, iron bosses of shields, and knives; while with the female remains were discovered jewellery, consisting of brooches, necklaces of beads, silver pendants, etc., also their household utensils, such as iron pot-hooks, keys, and spindle whorls, together with toilet requisites including combs and similar objects.

<sup>1</sup> Layard, N. F., *Proc. Suff. Inst. Arch. and Nat. Hist.* vol. XIII, pt 1, 1907, pp. 1-19.



## CHAPTER XIII

### *The Place of Origin and the Progress of Man*

THERE are few people who, when the matter is put before them in a way they can understand, are not interested in the past history of the human race. The discovery, in ancient deposits, of human bones, and of flint implements, enables us to form a very accurate picture of the appearance of the earliest progenitors of man, and of the status in life that they occupied, while the great antiquity of these remains gives a romantic atmosphere to archaeological research. But, while this is the case, one is sometimes asked, "What is the *use* of these researches, and what does it matter if the human race is 5000, or even 500,000 years old?" The answer to this question is, firstly, that the discovery of *any* new fact is of importance, and worth while, because it increases the sum total of our knowledge, and secondly that, by acquiring an understanding of these things, we are able to form a judgment upon the very important questions as to man's origin, and whether, during his long sojourn on this earth, he has progressed or otherwise.

The evidence of the antiquity of the human race in East Anglia, which is but a portion of this evidence that has been accumulated and is accumulating in various parts of the world, is overwhelming, and no one who has studied this evidence can harbour any doubt as to the immense period of time that has passed since the beginning of the Age of Man. This study shows, also, that, as we go further and further back in time, so the flint implements become ever simpler, and more primitive, in form, and reflect faithfully, it would seem, the type of people who made them. If, for example, we could find the skeletal remains of one of the men who made the Harrisonian Eoliths, there is little doubt that he would be found to coincide, in primitiveness of bodily form, with these most ancient of human artifacts. Thus, the evidence derived from the oldest flint implements, and the most archaic bones of man, that have yet been found, such as those of *Pithecanthropus* in Java, Piltdown in Sussex, and Heidelberg in Germany, point, unmistakably,

to man's origin from some remote ape-like, pre-human form.

The exact part of the earth where man's emergence took place is also of great interest, and has given rise to much speculation on the part of scientific people. The general weight of opinion upon this matter has been, and still is, that some part of Asia was the birthplace of mankind; and a large, and splendidly equipped, expedition, organised by the American Museum of Natural History, New York, is, at present, endeavouring to find evidence in Mongolia of the truth of this belief. So far, unfortunately, the efforts to locate the place of man's origin in that part of the world have not been crowned with success, but the field of research there is of great extent, and cannot be surveyed, and examined, except by years of painstaking work. It must be borne in mind, however, that there are no actual, valid, reasons, based upon archaeological discoveries, for regarding Asia as the place where the earliest stages of man's evolution were gone through, and it may be that these stages were enacted in some other part of the world altogether. Asia is still a veritable *terra incognita* to prehistorians, and it is possible that the habit of looking upon it as the place of man's origin is partly because, in the words of Sir Arthur Keith,<sup>1</sup> it is a part of the world "of which we know almost nothing, and therefore can believe it capable of anything".

So far as actual evidence of man's former presence goes, we have in East Anglia, as those who have read these pages will, I think, agree, a wonderfully complete record of nearly every stage in human progress from the earliest and most primitive flint implements, to the advanced types made at the close of the Stone Age. Thus, it is possible, that what is now England was the home of the earliest men, and there can be little doubt that if a tithe of the money spent upon researches in other parts of the world were expended upon archaeological work in Eastern England, still further and more important discoveries, bearing upon the question of man's origin, would be made.

Another, and important, consideration that emerges from a study of man's past history on this planet is that of human progress. There are, of course, some people who take a pessimistic view of man's progress. They point to the rise and fall

<sup>1</sup> Keith, Sir A., *Man*, vol. xvii, May 1917.



of the great civilisations of the past, such as those of Egypt, Greece and Rome, and argue from this that the history of man does not show any marked, and sustained, progress. But, apart from the fact that, in many ways, we have advanced since the days of the Egyptians, and the Greeks, and the Romans, to take these civilisations as a base-line in arriving at a conclusion as to whether man has progressed or not is an entirely misleading procedure. To be able to reach a correct decision upon this matter, it is vitally necessary to take the long view, and to adopt as a base-line the very earliest human beings, who were but little removed from an animal state, and whose highest mechanical achievement was a piece of flint, roughly chipped into a simple implemental form. The antiquity of these people, as compared with that of the civilisations of Egypt, Greece, and Rome, is profound, and dates back, probably, to a time separated from the present by not far short of 1,000,000 years. When we proceed to compare these most ancient flint implements with the mechanical achievements of the present day, we see that in this form of human endeavour the advance has been enormous. Again, when we consider what must have been the state of these people just emerging from an animal condition, we know that, with all the lack of perfection in human affairs at the present day, we have, nevertheless, attained to a development of intellect, and morality, using this term in its widest sense, which, without any doubt, is infinitely in advance of that of Pliocene man. In fact, it may be said with truth that even the man in the street of to-day would have been regarded by his earliest ancestors as possessed of almost god-like powers and influence. It is, of course, necessary to realise that the vehicle of human progress has not followed an uninterrupted forward course. Sometimes it has stopped, occasionally it has gone back, but, when a comparison is made of the attainments and conditions of the first human beings with those of civilised races of the twentieth century, the only real basis for such a comparison, then no doubt can be entertained as to the reality, and the extent, of the progress that has been made. But, though this is the case, and though man has advanced some way upon his difficult evolutionary path, yet it must not be imagined that he has attained, nor anything like attained, to the summit of his destiny. Geologically speaking the human

race is but a late comer on this planet, and even with all its present achievements is still only, as it were, upon the threshold. Man is always endeavouring to get into closer touch with and to establish control over his environment, but this power cannot be achieved quickly; it is bound to be a gradual process, but as it goes on, so will his lot in this world become more and more pleasant. The evidence of the certain, though slow, as is the case with most natural developments, progress of the human race over a period of, probably, 1,000,000 years seems to point to the operation of some at present undefined law of human progress which, as it has operated in the past, will go on functioning in the future. He would be a bold man who would venture to predict what will be the achievements of the human race in the remote future. But, if the present rate of progress is maintained, even the next few hundred years will witness an astounding change in man's whole environment, and it may be taken for granted that the present state of things will be then regarded in the same way as we regard, for instance, the condition of affairs existing in the Early Middle Ages. In these matters it is particularly needful to have a correct perspective, and the only thing that can give us this is a knowledge of the past history of mankind. The researches into this history which have been carried out by archaeologists all over the world are unfolding a truly majestic story of man's gradual ascent from the lowliest beginnings—to an ever-increasing height of attainment. We see him, in the dim days of the Pliocene, gifted with but little intellect, and armed only with sticks and stones, fighting for his existence with great and powerful animal enemies. We see him surviving the onset of arctic cold—and, as better conditions obtained, coming back to his old haunts and with undiminished courage taking up the struggle of life. And it is well to remember that, while without thought we may be inclined to look with contempt upon these primitive people of the past, yet, but for their triumphant, though enormously difficult, fight for survival we would not be in existence to-day. These are some of the things that a study of early man teaches. It teaches us to be philosophic, and to realise that the present is but a phase in an immense history that extends back into the remote past, and, so far as we can see, will extend into an equally remote future. It is



## PLACE OF ORIGIN AND THE PROGRESS OF MAN

destructive of the idea that "We are the people, and wisdom will die with us". Man is not engaged in a hopeless conflict with his environment—a weary swinging of the pendulum between advancement and retrogression—but from his earliest days has progressed, and, there is every reason to believe, will continue to do so in the future. That, in my judgment, is one of the most important lessons to be learned from prehistoric archaeology.





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